THE AMERICAN GAS LIGHT JOURNAL

PUBLISHING OFFICE No. 42 PINE STREET

DEVOTED TO THE INTERESTS OF ILLUMINATION, HEATING, MECHANICAL, CHEMICAL AND GENERAL SCIENCE.

VOLUME LXXXV., No. 17. Whole No. 1,637. | NEW YORK, MONDAY, OCTOBER 22, 1906. | $3 PER ANNUM, IN ADVANCE.

A. M. CALLENDER & CO., Proprietors. C. E. SANDERSON, Manager.
THOMAS J. CUNNINGHAM and ELBERT P. CALLENDER, Editors.

ENTERED AT THE POST OFFICE AT NEW YORK, N. Y., AS SECOND-CLASS MATTER.

CONTENTS.

An Asterisk (*) denotes an illustrated article.

EDITORIALS—

First Annual Meeting of the American Gas Institute, Special Editorial Correspondence by Telegraph 709

Briefly Told 710

A Reception and Inspection.

Report of Proceedings, Fourteenth Annual Meeting, Michigan Gas Association—Revised by the Secretary—Concluded from page 677 711

First Day, Afternoon Session—Gas Distribution at Grand Rapids, by Mr. A. F. Traver.—Discussion—Value of System in the Management of Gas Companies, by Mr. Richard Schadelielee—Discussion—An Invitation—Second Day, Morning Session—The Removal of Naphthaline from Coal Gas, by Messrs. Alfred H. White and J. M. Barnes—Discussion—Report of Committee on President's Address—Report of Committee on Memorials—Report of Committee on Next Place of Meeting—Report of Nominating Committee—Election of Officers—Two Responses—Adjournment.

Second Annual Meeting, Iowa Gas Association—Official Report—Revised by the Secretary—Continued from page 672 718

Second Day, Morning Session—Discussion on Mr. Warnking's Paper—Something from the Entertainment Committee—Second Day Afternoon Session—Report of Committee on Increasing the Scope of the Association—A Vote of Thanks.

*The Part Taken by the Consolidated Gas, Electric Light and Power Company in the Recent Industrial Parade 721

* *The Lander Anemometer and Gas Pressure Recorder 721

ITEMS OF INTEREST FROM VARIOUS LOCALITIES 722

Greenwich, Conn., Wants Gas—Mr. T. F. Wolf Resigns from the Penn Gas Coal Company, Mr. A. P. Cameron Succeeds—Gas Rate at Hartford, Conn.—New Gasholder for the Brookfield (Mo.) Gas, Electric and Heating Company—The Standard Gas and Electric Company, of Raleigh, N. C., Sells its Electric Lighting Plant—Meeting of the Illuminating Engineering Society—Gas Rate at Alexandria, Va.—Contract for the Baltimore Retort and Firebrick Company—Justice Gaynor and the Brooklyn Union Gas Company—Meeting of the Engineers' Club, of Cleveland, O.—Betterments at Beloit, Wis.—Mr. Henry Nickerson Goes to Quincy, Ills.—Harvesting by Gas Light—Lecture by Mr. B. O. Tippy—Little Falls, N. Y., Asks a Reduction in Rates—Annual Meeting of the Granville (N. Y.) Electric Light and Gas Company—Stresses of Winds on Gasholder Structures—Mr. C. H. Quackenbush at East St. Louis, Mo.—Brooklyn Contract Rate Gas Case—And Many Other Items.

The Market for Gas Securities 724

[Special Editorial Correspondence by Telegraph.]

FIRST ANNUAL MEETING OF THE AMERICAN GAS INSTITUTE.

AUDITORIUM HOTEL, CHICAGO, October 17, 1906.

Dear JOURNAL: The first annual meeting of the American Gas Institute, in so far as its first day's work is concerned, was brought to a close at 5 P.M. to day. The weather was all that could be desired, although it might be remarked that overcoats were not at all necessary.

The meeting room was the handsome banquet hall of the Auditorium, and the Acting President, Mr. B. W. Perkins, of Altoona, Pa., had the satisfaction and pleasure of calling to order the largest and most representative body of gas men that ever assembled in convention in the United States.

Over 300 responded to the initial summons, and before the morning session had ended at least 20 score were recorded. This, of course, meant that Mr. John Williamson, Chairman of the Committee of Arrangements, and his 8 able lieutenants, had no idle moments, and they are to be and were congratulated on all sides for their ubiquity and unceasing attention to the needs of their host of guests.

Acting Secretary Mr. James W. Dunbar, of New Albany, Ind., whose wealth of one time glossy black locks is now tinged with streaks of sedater hue, smiled grimly from the recorder's desk; but time has in no sense lessened his activity or marred his perceptive senses, although he may in memory hark back to the days of long ago, when General Charles Roome and his *confreres*, in the Knickerbocker Cottage, New York, laid the foundation of the American Gas Light Association. Of that band of pioneers few remain, but the soundness of their basic work was far stronger than they knew, and the structure that rests thereon is of far greater magnitude than their fondest hopes could have pictured. Enough of this, however.

The session having been called to order, the President introduced the famous Mayor Dunne, of Chicago, who jollied his welcome to the gas men in his inimitable style, his message being rounded out in a salvo of applause. The response was made in the neatest sort of style by Mr. Charles H. Dickey, of Baltimore, whose well put speech was in that debonair gentleman's best vein.

Real business was commenced with the reading of the report of the Board of Control, as there was no set address by the President. Since all the details thereof will be printed in due season it is only necessary to here remark that its several sections seemed agreeable to the Convention, for they were adopted with but little debate and less revision. It was decided that there would be no official banquet, but it was voted that a subscription affair be brought off in the Auditorium tomorrow evening.

An extension of time to December first was voted in which Charter Membership could be secured. The list of such members at the opening of the meeting was well over 900. Other routine business was transacted smoothly, and a beautiful tribute to the memory of Mr. Charles R. Faben, of Toledo, O., many times honored by the Associations to which he belonged and which he so ably upheld by word and deed, was read by Mr. E. G. Cowdery. The Institute's tribute to his worth was an affecting one.

The presentation of the annual report, showing the good work being accomplished by the Committee in charge of the educational fund of the American Gas Light Association was presented in concise form by the Secretary and administrator thereof, Mr. A. E. Forstall, amply proving that the fund is fully realizing the aims of its originators.

The afternoon session was marked by the reading of the report of the Committee on Uniformity of Gas Meters, contributed by Mr. C. H. Dickey, on behalf of the Ohio Gas Light Association, which was followed by the paper by Mr. J. M. Rusby, on "Consumers' Meters: Causes of Variation in Proof," which was fully discussed. Notable in this connection was the part taken by Mr. T. G. Marsh, of England, whose speech was a most excellent one.

Mr. K. M. Mitchell here assumed the Chair, and Mr. W. H. Gardiner, Jr., of Boston, on behalf of the Western Gas Association, read the report of the "Committee on the Making of Rates and the Additional Business System of Costs." It was an excellent presentation and the subject was ably discussed.

It was followed by the adoption of a motion to appoint a "Committee on Matters of Public Policy," to carry on the work outlined in the report.

Next came the report of the "Committee on Revision" (account of the Ohio Gas Light Association), which was handed in and read by Dr. H. B. Harrop. It lead to a spirited discussion which was marked by a fitting acknowledgment of the work done in this matter by Mr. F. W. Stone. The committee was ordered continued.

Mr. H. L. Doherty, on behalf of the Ohio Gas Light Association, explained at length the present status of the Question Box, and the discussion terminated in a resolution that the Institute should continue this work.

The paper by Mr. W. H. Gartley, of Philadelphia, was then taken up. It was a most efficient presentation of the subject of "The Delivery of Uniform Candle Power to the Consumer Through all Seasons of the Year," and provoked a most interesting discussion in which some novel theories were advanced. It was ordered that the Institute appoint a

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SMITHSONIAN DEPOSIT.

committee to investigate methods of taking candle power, and the round of applause that followed the vote of thanks to the author of the paper caused the veteran Gartley to fairly blush.

The paper on behalf of the Pacific Coast Gas Association, by Mr. E. C. Jones, of San Francisco, entitled, "The Effects of High Pressure Upon Illuminating Gas," was read by Secretary Dunbar in the absence of the author. The Secretary previously read a telegram from Mr. Jones, wishing the Institute good luck, good weather and Pacific Coast greetings. The discussion of the paper, which was a brisk one, was terminated by a hearty vote of thanks to Mr. Jones and the Pacific Coast Association. The regular business of the day was then declared terminated.

The Convention learned with much regret of the death of Col. James H. Armington, of Riverside, R. I., whose yeoman service in the early days of association work is lovingly remembered. His death occurred last Monday, but doubtless you have heard of the sad event.—C.

CHICAGO, ILLS., Oct. 18th, 1906.

Dear JOURNAL: The elements were seemingly against the gas men to-day. Rain was their portion, and while it poured, both Chief Williamson and his men were truly busy. The Chief is attending to us all in headquarters, both on the committee and in the generating houses of the Peoples Gas Light and Coke Company. One division was greeting us with welcome, the other was sending us their product which lights and cooks. Truth compels us to say that the Auditorium has small use for the one, but it has plenty of use for the other. The sessions of the second day were opened at the time appointed and an excellent audience was on hand.

The first business transacted was the reading of many telegrams and letters from those unable to make the journey, expressing their sorrow and proclaiming their good wishes.

This was followed by a contribution to the discussion of a prior paper. Mr. Van R. Lansingh, of New York, then read a most interesting paper on "Mantle Standards," which, after having been well discussed was followed by a flash light photograph of the members in session assembled. At the sound of the report the flags facing the group, and backing the Presidential platform, which had been neatly rolled up, fluttered to full length amidst a salvo of applause. The report of the Nominating Committee was then read by Mr. E. G. Pratt, which in well chosen speech named the following officers for the ensuing year:

President.—Walton Clark,
First Vice-President.—C. F. Prichard.
Second Vice-President.—H. L. Doherty.
Treasurer.—T. C. Jones.
Secretary.—J. W. Dunbar.
Trustees.—(One year)—John Williamson and W. H. Bradley. (Hail to the Chiefs.) T. D. Miller, W. A. Wood and W. B. Cline. (Two years) F. H. Shelton, H. D. Whitcomb, Jr., J. T. Lynn, S. S. Kellogg and F. W. Stone.

An official ballot for the election to office of those named was ordered, and Teller Pratt announced the result, which was heartily acclaimed.

A very well rounded speech of acceptance was made by the President elect. Mr. Clark seldom shows emotion, but this time he certainly did. Vice-President Prichard, in his quiet way, accepted the preferment put upon him, and the rest of the ticketed did not shirk their duty. A recess was ordered.

There is no statement of their interest in the sessions, but the gentler contingent, and a charming lot they are, are lamenting that "into each life some rain must fall."—C.

CHICAGO, ILLS., Oct. 18, 1906.

Dear JOURNAL: The afternoon session of the second day completed the business proper of the Institute. Order was called on time, and it should be here said that the proceedings all through the convention were conducted in a manner that reflected well the ability of the men at the helm, and it is the province of the writer to say that Mr. Perkins, as a presiding officer, in every sense fills the bill. An excellent attendance marked the final session. The Iowa Association's wish to join the fold, under the guidance of the Institute, having been heartily assented to, a report of results on tests of No. "A" meters, covering the actual workings on a large scale of same for one year, was read by Mr. Walton Forstall. The Institute then listened to the chapters submitted by Mr. George Williams in behalf of the Ohio Association, respecting its "Novelty Advertising and New Business Methods Department." The discussion thereon was followed by the contribution from the Natural Gas Association, as read by Mr. W. M. Welch, on "Extinguishing the Flame of a 600-Pound Pressure, 1,000,000 Feet Hourly Capacity Gas Well." It was a well told story, and the lantern slide illumination of the different phases of the struggle were eloquent of the nature of the work so successfully done; 40 or more pictures were thrown on the screen. Then Mr. H. L. Doherty, on behalf of the Ohio Association, read an interesting report from its Committee on Standard Method of Testing Fuel Gas Appliances. He certainly well deserved and held the attention of the members, and wholly merited the vote of thanks that was passed to him. Mr. Bryce McAdam here read the joint production on behalf of the Western and Ohio Associations respecting the Wrinkle Departments of both, put together by himself and Mr. W. E. Steinwedell. Secretary Dunbar, having read a letter from Mr. A. G. Glasgow, dated this month in London, England, regretting that business that would not be denied kept him away from the meeting and tendering his heartiest wishes for its success, put the paper prepared by Mr. Glasgow on "Electrolysis," for the account of the American Association, before the Institute. The discussion on the matter was lengthy and thorough, at least a score taking part in it. The Institute determined to carry on the work in a way that will at once undoubtedly be productive of positive benefit.

The Committee on Next Place of Meeting reported in favor of Washington, D. C., which determination was heartily indorsed. Mr. C. A. Learned followed with the paper on "The Relation of a Commercial Gas Man to the Industry," which was handed in on behalf of the National Commercial Gas Association, it was the joint production of Messrs. Learned, J. C. D. Clark and Richard Thomas. It was a good document and was discussed at some length, a notable participant in the debate being that bundle of nerves, Mr. R. M. Searle. Mr Forstall here put in a plea relating to refinements regarding "Standard Castings," which having been heard, was adjusted by proper action. The excellent work done by Mr. D. W. Low, at the instance of the Ohio Association, in respect of the report concerning the "Bureau of Forms and Records" having been acknowledged in formal manner, the meeting listened to verbal progress report from Mr. T. D. Miller. It had to do with the "Economic Balance between Calorific Power and Candle Power," which subject had been under consideration by the Western Association.

Through a regularly appointed committee, the Institute directed that the work continue under its auspices, Mr. Miller to continue in charge thereof. The institute here ordered that a special message of good will and fraternity be sent in its name to your Mr. Charles E. Sanderson, whose absence from the convention because of illness was deeply deplored. An adjournment was ordered until to-morrow, but I may say that the set business of the sessions is at an end. The subscription banquet is on in the Auditorium Hall, as I write. That it will be a royal one admits of no doubt. There is no prearranged outing for to-morrow, but separate squads have been recruited whose members will enjoy to the full the abounding sights of this wonderful city if the rain will only cease. To end this straggling story of its first annual sessions, if the others are to be like it, then indeed is the American Gas Institute founded on a base that neither time nor shock may successfully assail.—C.

BRIEFLY TOLD.

A RECEPTION AND INSPECTION.—In response to a handsomely engraved invitation, about 125 gentlemen connected with the gas industry in New England, friends and customers of the Nathaniel Tufts Meter Company, gathered on Saturday, October 13, at a reception and inspection of the Company's new plant at 455 Commercial street, Boston. The business of the Tufts Meter Company was started in 1849 by the late Nathaniel Tufts. In the changes incident to the passage of time, it has borne the name of Tufts & Cheever, Nathaniel Tufts, Tufts Bros. and Tufts Meter Company, and as its business has prospered has occupied quarters constantly increasing in size, till now it occupies a handsome fireproof structure of its own, located in the heart of the business section of Boston, facing Copps Hill, from which the people of Boston witnessed the battle of Bunker Hill, across the narrow river, but a stone's throw from the historic spot where the Bostonians of years ago had their "tea party," and adjoining the wharf where was built and launched the world renowned frigate "Constitution." The building is of artistic appearance, is 6 stories in height, built of brick and terra cotta, with terra cotta and concrete floors. It is thoroughly fireproof, is situated on a corner approached by a broad avenue and presents a handsome appearance, reflecting great credit upon its architect, Mr. Bowdich, both in appearance, design and fitness for its purpose. The first floor is occupied by the offices of Treasurer Norton and the clerical force, the machine shop for heavy work and the shipping department, into which the loaded teams can drive; on this floor is also located the gas engines furnishing the power. The second floor is the stock room. The third and fourth floors are for inspection and proving. The fifth and sixth floors are devoted to new meters and repairs. Two elevators reach the various floors, and each floor is provided with ample washrooms and individual closets for the storage of the employees' belongings. Broad benches extend around the room, equipped with all the best facilities for the work. Racks for meters and stock are in place, and two cosy testing rooms are reserved—one for the Company and one for the State Inspector. Each floor is about 8,000 square feet area in one undivided space. The light from the front and side is thrown to the white ceiling by prismatic glass in the upper sash above the line of vision. The lower sashes have wired clear glass for direct lighting. This combination produces a perfectly lighted series of workrooms. Started by so honest and staunch a man as Nathaniel Tufts, surrounded by these historic associations, which breathe our forefathers' idea of the square deal, occupying so well conceived and executed a factory, employing a force of workmen whose good wishes towards their employers were shown by a handsomely designed floral piece sent to the opening, and guided by the deft touch of Harry Norton, the course of the Nathaniel Tufts Meter Company must be of necessity one of business prosperity. After a handshake all around and an inspection of the factory, the party were led to the sixth floor where they were welcomed by Treasurer Norton and the inner man amply cared for. After lunch, President Dickey spoke for the Company, expressing his welcome, his appreciation and thanks for the past business and his desire that the Company should so carry on its business as to merit the continuance of the pleasant relations which exist between the firm and their customers. Vice-President Africa responded for the New England Association and President Coffin for the Guild, alluding in his remarks to the long headedness of the Company in locating Harry Norton alongside of the Lowney chocolate factory, as he expressed it, "two sweet things together." After the speeches the party broke up with mutual good wishes.

[Official Repobt.—Revised by the Secretary.—Concluded from Page 677.]

REPORT OF PROCEEDINGS, FOURTEENTH ANNUAL MEETING, MICHIGAN GAS ASSOCIATION.

Held in Grand Rapids, Mich., September 19, 20 and 21, 1906.

First Day—Afternoon Session.

The President introduced Mr. A. F. Traver, who read his paper on

GAS DISTRIBUTION AT GRAND RAPIDS.

[For the text of the Traver paper, see Journal, Sept. 24, pp. 539-40.]

Discussion.

The President—Gentlemen, the paper you have heard is of interest to all. I hope it will bring forth a good discussion, as a good many of us are in the same position as Grand Rapids has been. I will call on Mr. Dewey.

Mr. V. F. Dewey—The first part of this paper is devoted to matters of historical interest only. In one part the author speaks of the limits of the system as it is working here in Grand Rapids, which limit he has fixed by saying, "This point is reached when the cost of pumping, plus the interest, depreciation and repairs on the pumping plant and service governors, plus the cost due to increased leakage, are above the interest charge on larger mains to produce the same result, and it is simply a question of figures as to which method may prove the more profitable." I certainly would be interested in seeing some of those figures. That would bring up the point, "Where is the limit?" That we would like to know. Do you feel in Grand Rapids that you have reached or anywhere near reached the limit? What effect has the increased pressure you have been operating under had on your leakage? What do you estimate the depreciation on your governor? These questions brought out by this paragraph have not been answered at all. It is barely possible Mr. Traver can give us some figures that will enlighten us. There is no doubt that this system of distributing gas is the cheapest so far as installation costs are concerned, and there is no question that this system is bringing out the efficiency, the maximum distribution efficiency, of our mains; but it is simply a question with all of us, "Where do we reach the limit?" Another point: He makes the statement regarding the use of positive pressure blowers instead of the fans, which results in an increased investment before it is needed" (speaking of positive pressure blowers), which is true, "and also a slightly increased operating cost." I would question that last statement, although the answer to the first one would possibly answer this question. "Where or what is the highest limit at which you can economically operate a fan?" We do know that when we take the curves, the horse power per hour per 1,000 cubic feet of gas delivered per hour, that there is a definite curve for the fan and also a definite curve for the exhauster or positive pressure blower. Where do those two curves cross each other? The limit, according to the American Blower Company, of the economical efficiency of the fan is somewhere in the neighborhood, as I remember it, of 8 to 12 ounces. Above that the horse power required to deliver 1,000 cubic feet of gas per minute gets to be very large, whereas in the exhauster we get the efficiency almost as directly as the pressure. I am very much interested in the necessity for venting the diaphragms or the regulators. Undoubtedly this giving off of gas through the diaphragm of the regulator is due to some sort of osmosis; that is, the oil saturates through the diaphragm leather. To my mind the installation of the booster system, whether it be a high or a moderately high pressure system, is something that will be necessary in every fair sized city. You may call it the belt system or whatever you please, but in connection with that belt system and its operating we will say probably from a minimum of 5 pounds up to a possible maximum of 20 pounds, depending on the kind of pipe we use, whether it be cast iron or steel or wrought, we will still have the necessity of distributing gas at high pressures in our low pressure mains and yet there will be the necessity of service governors. This also brings up the question, what are the economical limits between the maximum and minimum pressure which we may allow at the appliance? Can Mr. Traver throw any light on that? What is the limit of a stove, for instance? What are the limits at which a Welsbach light may be operated economically? What are the limits at which industrial fuel appliances may be operated economically? All of these questions and proper answers to them are necessary in the proper study of this system. I should like to have Mr. Traver give us some light on these subjects.

Mr. Steinwedell—I received a copy of Mr. Traver's paper a couple of days ago and was asked to write a little discussion on it. While the fan method is no doubt best adapted for use in cities where gas companies have large distribution systems already installed, it is a question, under the conditions as they exist to-day and which are widely different from what they formerly were, as to whether distribution at a higher continuous pressure of from 15 to 20 pounds per square inch, would not be better for a new installation. This would provide for supplying outlying districts and adjoining towns and, with the aid of governors, give an even distribution as well as take care of any excessive peak loads, which in Northern cities are of longer duration than in Southern. Of course, the fan system has the advantage of not having to be run continuously, as at certain times of day and night in winter and oftentimes for all summer the fans are not run at all, but as both methods are in successful operation the question in each case has to be decided according to the relative costs of initial installation and future extensions. I should like to ask Mr. Traver the following questions:

"Are the fans operated in summer in Grand Rapids at present, and if so between about what hours?"

"When are the fans operated in winter?"

"What is the lowest pressure at which it has been found advisable to run the fans at all?"

"What is the highest pressure at which the fans have been operated?"

"Is the pressure to be carried at the works determined by the pressure delivered at the up-town or in some outlying district?"

The methods employed in Grand Rapids for preventing low pressure in a rapidly increasing sendout having a large peak load have been presented in a very clear and concise manner, and I am sure we are all indebted to Mr. Traver for his valuable paper which will be referred to by many other gas companies who are having low pressure troubles or who will experience them in the near future.

Mr. E. P. Lloyd—The experiences detailed in the first part of the paper lead one to speculate on how much depreciation one would have to charge off on booster installations. I think we are confronted with a comparatively small amount of experience but a great deal of speculation as to what are going to be the requirements, and ultimately the method for meeting the loads. As I understand the situation here they are forcing into the existing mains, on occasion replacing existing mains with larger ones and increasing also to some extent the pressures as the demand increases. That has perhaps been tried in a number of places, and is the first step that one might logically turn to for a relief from low pressure—at least it presents a most economical method of meeting the immediate question, but if we are to lay out a system for distribution having regard to very considerable increases in the future, it is a question in my mind whether it is an advisable method beyond looking to it as a temporary one. My own idea is we will see a development of carrying the high pressure lines, which will run probably into pressures of 30 or 40 pounds, and cutting those into the distribution system, with governors for maintaining a pressure when it is necessary, on those high pressure lines. During the off hours of the day, low consumption, and at night, those blowers would not be in use, and instead of using the rotary blower we would use something in the nature of a reciprocating blower such as used in blast furnaces, maintaining a high pressure all through that system which will automatically cut into districts where it may be required. We are confronted, however, in many cities with the serious problem of electrolysis when we attempt to distribute under very high pressure. That is perhaps a question almost wholly speculative at the present time, as to how those high pressure lines may be protected. It is done fairly well with bonding, but that is an expensive method and seems to be crude. There is no question though that we have these peak loads to contend with, and if we are to attempt moderate our low pressure distributions it will carry excessive investment, and I believe we will have to find the relief from investment in moderate sized installation and increase the pressure.

The President—Mr. Knight, we will hear from you.

Mr. J. J. Knight—Mr. President, this is not a question which I have solved in any way. I think Mr. Lloyd's position is the right one; I agree with him perfectly. The question is how to get the gas delivered to the consumer at the proper pressure and uniformly. That is one of the advantages of Mr. Traver's system; it is a uniform pressure, as I understand it. It should be given credit for something because that is worth something surely. How to keep up with the growth of cities and the growth of business is the pressing question in the gas business. I agree with Mr. Lloyd in the general summary he makes.

Mr. H. W. Douglas—Mr. Traver's paper brought back to me a number of questions which I had to consider 3 years ago when we installed a high pressure boosting system. Our main system was in very bad order. Our pressures were very uneven, and in a part of the town about a mile from the works in such bad shape that it had to be

taken care of at once. In comparing costs I found that while the cost of installing the larger mains sufficient to take care of this part of the town was less than the high pressure system, yet it lacked the flexibility; that is, to get to our first station where at that time we required the increase of pressure. Since then we have carried it forward to another station, next year we will carry it to another, belting the town, that is, starting in that direction. The results have been entirely satisfactory. When we come to figure on our more extreme stations the cost will be cheaper than putting in the larger main. I did not consider the blower system, as it had not been used to any extent, but I conceive the same objections to that, that there would be to putting in the larger main, and that is lack of flexibility. The high pressure main we installed can be doubled or tripled by simply increasing the pressure. We carry now about 15 pounds, and can very easily increase that pressure and increase the capacity of our pipe, thus making it a very flexible system. I do not like the idea of all these service regulators. While they may give results, their care must be enormous. Everything of that kind which is complicated increases the cost of distribution, and Mr. Traver evidently has not figured that in—had no data on which to figure it in his original estimate.

Mr. E. P. Lloyd—I would add to my former remarks that I think the belting system would have very considerable effect in overcoming so-called naphthaline troubles. By the increase of pressure we relieve the gas of a great deal of moisture which it naturally carried under the lower pressure and that gas denuded of that moisture being thrown into the mains would have a capacity for picking up moisture out of them, from the gas which had been delivered under the ordinary atmospheric pressure. It would be safe in this sense that, connecting into the mains fed directly from the holder, it would only feed into so much of the district as required the excess of pressure, and in the event of any accident to the regulator or otherwise the pressure could go back up into the holder increasing slightly in that particular district. In other words, it would be self-adjusting as to uniformity of pressure and would enable the appliances, stoves, mantles, etc., to be adjusted for a uniform pressure under all conditions of working. That is a necessity if we are going to get the most efficient service and have the least complaint from our general appliances.

Mr. B. O. Tippy—I think Mr. Knight called attention to an important point in the discussion which is that with individual regulators you are going to have perfect regulation and uniform pressure, which is of the utmost importance. Mr. Lloyd mentions the compressing of the gas to 30 pounds or higher. I think he will find it pretty expensive work compressing gas to that pressure, and while that does compress out a good deal of moisture so will the plant in Grand Rapids compress the moisture at the manufacturing plant and it will run away to the drips and be removed. I think the installation is too recent to answer very many of the questions asked. For instance, we do not know what it is going to do to the leakage if you run the pressure up and what the cost of taking care of the governors will be; it is too new. If the governors are not expensive to take care of it is certainly a good system in my opinion.

Mr. H. W. Douglas—May I ask the total cost of installation of these governors, approximately?

Mr. Traver—The smaller ones cost us a little better than $2, installed complete; those that take care of a 10-light meter, with a capacity of about 300 or 350 feet an hour, with a very low drop in pressure, will cost about $4; the larger size will cost about $5 to $5.50 each.

Mr. D. H Fraser—Mr. Tippy said the increase in amount of leakage due to increase in pressure could not yet be known. I understand they have gradually increased their pressure here for the last 3 or 4 years, so that if there is any increased leakage due to increase of pressure, they must know it must have gradually increased during the last 4 years. One point in regard to the high pressure boosters fed in at different points is that the high pressure is only in the booster line, where with this system in Grand Rapids you have an extremely high pressure throughout a great part of the main system. It would seem the question of leakage is quite important. I think also we cannot wait to determine what is the best method for taking care of this situation; it is up to all of us to do something, and do it quick in order to take care of the fast and largely increasing consumption of gas. I know we have just recently got into the sale of gas for industrial fuel and invariably when we get started with a factory we find that our system is inadequate to supply the business that we have a chance to get. Mr. Traver mentions on the last page that he knows of no other city having franchise pressure requirements. I understand Jackson has a provision in its franchise recently granted which requires certain pressure regulation.

The President—I think this necessity for boosting the pressure is due to the neglect of the companies to keep their main systems up to the demands of their increasing business, and I think it is a great deal more expensive when you take everything into consideration to put in these make-shift arrangements than to lay the necessary size mains. And if you are going to pump gas at any pressure above the ordinary, as Mr. Lloyd suggests if you are going to pump it at 1 pound, why not pump it at 40 pounds and get that much increased capacity on your mains. Another thing about these appliances is that a great deal of risk is connected with them. We cannot afford to take the risk of break-downs and shut-downs in addition to the greater expense attached to the distribution looking after the governors, etc.

Mr. V. F. Dewey—I wish to add a little to what I have said. I have been making some figures as to what would be the relative cost of applying at Detroit such a system as this at Grand Rapids, in comparison with the system we have there now. I figure it would be about one-half the cost to put in the regulators and proper blowing machinery to carry on the system such as they have here in comparison with our system in Detroit, but we would have to carry the pressure on the low pressure mains around the works to practically 50 inches in order to distribute gas to the outlying districts such as we do now—a pressure which I consider altogether impossible with our low pressure system. The system in Grand Rapids is good as far as the regulator is concerned; it is excellent. I believe we are all going to come to putting a regulator on each service, but as far as the distribution is concerned, it is a makeshift and it is only a question of 2 or 3 years when they will have to abandon it and put in their feeder mains. That is my opinion. You can see the absurdity of the thing when you get up to 50 or 60 inches. When your increased sendout amounts to 10, 12 or 15 per cent. a year, your increased pressure goes up a good deal faster.

Mr. E. M. Osbourne—I have not any data for what I have to say, but it may be interesting to some to know that Chicago has been using the booster system of old-type Sturtevant fans. They have been in use there a good many years and they consider the system very successful, using it on large mains. They have mains running from 48 inches down, and use those fans or blowers, as you may term them, of a type much after the style used in the blast for the water gas apparatus. I only make this statement as to what they thought of it, because at the time I was there I was not in touch with what we might call the "push" sufficiently to get at the data. The fact is, as they began to need more of the booster system they began to install the Roots exhauster, and are using that I think, at least they were using it quite extensively when I left there about 4 years ago. The initial pressure leaving the outlet of those fans was about 250-tenths, and, of course, at that time no arrangement was made for taking care of a reduction of pressure to the consumer. While there were a good many complaints over the fact that along the lines close to where these were installed it would blow your head off—as the saying was—still they went along; whether something else has been done since I don't know. Later they used those exhausters and were using them when I came away from there very successfully as far as getting the gas to the consumer was concerned. As to how that pressure met the requirements of the fuel connection, or the people burning gas, I cannot venture to say. I just give these as facts.

The President—If there is no furthur discussion we will hear from Mr. Traver.

Mr. Traver—The whole question is one of cost. I do not think anyone here can figure any saving in any kind of a booster system over a system of this kind. As to Mr. Dewey's saying that this is a makeshift arrangement and that 50 inches is impossible on the present distribution system, I think he is entirely mistaken. I think 50 inches is not at all out of the question. I have sections of mains tested up above 50 inches and apparently had no trouble, as far as the governors are concerned. They will take care of that very nicely. Regarding the high maintenance cost of these governors, of which Mr. Dewey also makes a great point. I do not think there is anything in that high maintenance cost; there is no reason why the maintenance should not be very, very low. I do not think the high pressure companies are having any trouble to amount to anything in maintaining these governors, and I know we have had probably 25 governors in use for years. I know that in the last 5 years they have not been touched. Once in a while we have taken the pressure readings at the outlet. I think the maintenance will not amount to much of anything, but as far as that is concerned all the governors we are installing now to take care of this extra pressure could be replaced every 5 years, and still we would come out ahead of the game. Another point Mr. Dewey makes is about the increased operating cost of positive blowers. Of course there is no question that when you get into these higher pressures the positive

blower will pump cheaper than the fan blower, but we only want this high pressure during a very short interval; that is, at our maximum instantaneous peak. Up to this time the pressure is gradually working to the maximum and afterwards gradually decreasing to the minimum, so that for all times, except the instantaneous high pressure, we take advantage of the high efficiency of the fans on moderate pressure. We could afford to operate these fans and still come out ahead of the game, over the cost of placing these blowers in the first place. A positive blower, depending on the installation, has to pump against this high pressure at the very outset, that is, they have to pump against the maximum pressure whether it is 5 pounds or 2 pounds; it is pretty hard to reduce the pressure very much. Regarding the variation of pressure on appliances, or what variation we can allow on appliances. Of course there is no question but at the present time they will stand quite a variation, some of them; a Welsbach lamp, at an inlet pressure of 3 inches, will probably stand, without being able to detect much difference in the efficiency, about 35 per cent. increase easily—I think 33 per cent. is the test we made; of course they will stand that variation all right; possibly 1½ on a 3-inch initial pressure, but at the same time you cannot help admitting they would work better if we had absolutely uniform pressure on. I do not think anyone will doubt at all that every appliance will work better, and appliances as they are coming in now, some of the industrial appliances, such as linotype machines, etc., require almost absolutely uniform pressure. Mr. Dewey admits that some day we may all have to put in regulators. If we have to put them in some day why not put them in now and stop the high cost of this booster system? Mr. Douglas said the advantage of an independent booster system with him is, he can vary the pressure on it and increase the amount of gas passing through it; but you can do exactly the same thing by boosting directly into the street mains. It is only a question of cost. If you can afford to do that, well and good, if you can put in larger mains in certain places to carry this out; but ordinarily you will find they will be in in very short stretches, thus keeping your investment down until such a time as it is needed and not before. Mr. Steinwedell asked if the fans were operated in summer in Grand Rapids. During the past summer we have not operated these fans at all, but probably next summer we will have to start them going for half an hour at noon. The fans are operated in winter about 3 hours. The maximum pressure we carried last winter was 11 inches. He also asks, "What is the lowest pressure point at which it has been found advisable to run fans at all?" It is not advisable to run the fans when the pressure required is below your pressure at the holder. When you require pressure higher than the holder throws, then start your fan. The pressure carried at the works is determined not by the pressure in the downtown office, but by the pressure at the low points in the district. You find out the pressure at the lowest point and carry whatever pressure you decide on is the lowest allowable there and run your fans accordingly. Mr. Fraser said we have to do something and do it quick. I think this is about the quickest thing we can do. It is very easily and quickly installed, and certainly will do the work. Mr. Barthold states that this was a makeshift arrangement. I do not think it is. In fact I think it is a permanent arrangement, with nothing "makeshifty" about it. [Mr. Traver here exhibited sample governors.]

Mr. E. M. Osbourne—You install your governor on the inlet?

Mr. Traver—Yes, sir.

Mr. Osbourne—So that your meter comes on the other side?

Mr. Traver—Well, you do not want your high pressure on the meter.

Mr. Osbourne—Wouldn't it be an argument in favor of the system that the meter would last longer by reason of the less pressure that it would have?

Mr. Traver—Of course, the booster system would keep the pressure down to where it would not hurt the meter at all.

Mr. Hellen—I would like to know how it would help the meter?

Mr. Osbourne—I thought the governor was on the inlet.

Mr. Traver—Yes, sir; before it reaches the meter.

Mr. Osbourne—One claim of the meter manufacturers is that the initial pressure does not want to be too heavy or it will be injurious to the meter. Now even if the cost of these governors was large, wouldn't that help the company in not having to buy so many meters; wouldn't they last longer?

Mr. Traver—I don't think so, for I don't think you put pressure enough on meters in the first place, that is, if you did not have a governor at all you would not put pressure enough on the meters to harm them, but you would get into trouble with your consumers. You have to reduce the pressure somewhere, and probably would reduce it at the meter rather than afterwards.

Mr. Osbourne—What is your initial pressure, at the tip, we will say?

Mr. Traver—Probably it goes up at the tip to about 25 tenths.

Mr. Osbourne—Suppose it was 100-tenths?

Mr. Traver—Well, it is that on the service.

Mr. Osbourne—Your governor takes care of that, does it not?

Mr. Traver—Surely; but if we undertook to put 10 or 12 inches on a consumer's house, on the burner, on his stove and on his incandescent lights and all his appliances 1 minute and then perhaps half an hour later drop that down to 3 inches, I think we would get into trouble with him.

Mr. Osbourne—You surely would. I was just using that as an argument.

Mr. Hellen—I claim it won't hurt the meter at all—it is a question of a drop in pressure through the meter—unless you go to extremes. Say you take a 5-light meter carrying pressure of 3 pounds at the inlet, you would only have a drop in pressure of 5-tenths. It does not hurt your diaphragm at all.

Mr. Osbourne—I would not think it would either. He claims, you know, or the fact is that in some places the variation in pressure is much greater than that which he has spoken of—25-tenths.

Mr. Hellen—Then if you get a pressure of 4 pounds on your regulator you should have a vent attached to it; that is another extra expense. It should be attached with a vent so that you carry it outdoors. In case you have an explosion that blows a house up, the loss will pay for several regulators. I wish to express myself practically the way Mr. Dewey does, that it is a makeshift arrangement, and for this reason I believe that in this town, if you are going to continue the same as you are now and put regulators all over, in order to carry 2 inches pressure at the outskirts of the city you have to carry 3 pounds pressure at your works.

Mr. Traver—Suppose you do.

Mr. Hellen—Then you have got to put a vent on every one of your regulators.

Mr. Traver—We have them now.

Mr. Hellen—It costs you more than $2 to set them, and I would like to hire a few men who can put on 10 or 12 regulators a day. Not only that, but if you are going to carry that pressure on these leather diaphragms, inside of 3 years you will be surprised at the number you will have to change. If you have 7,000 of them on you will be surprised at the number of men you will have to keep to maintain those in repair in a few years. I am speaking now a great deal from experience. Not only that, but if you put a pressure on your low system at the works of 3 pounds, there is no question your leakage will be so high that you cannot afford to carry it. As a little illustration: While in Detroit our leakage was high; we had a 6-inch gas main, 2,600 feet long, that has been laid for a few years, with lead joints, and that had a dead end. I thought we would experiment to determine what the leakage was. I put 2 inches pressure on that length of 6-inch pipe and there was practically no leakage, and at 25-tenths pressure there was practically no leakage; but when I increased above 25-tenths it began to leak, and when I reached a point of 10 inches that gas main leaked at the rate of 200,000 feet a year per mile. To go back, I cannot see how you can get a man who will set these regulators, attach them to the meter and install 10 of them a day and do it right. As I say, they will reach a point here where they will have to come to a booster system. I believe in a booster system for a town of any size; Grand Rapids we will say, or larger. And also believe when putting in that booster system not to connect it to your low pressure mains oftener than absolutely necessary, for the reason the cost of the governors in your street will amount to less. I would do that and decrease the cost of repairing the governors. If you are to put in a high pressure system, don't put it in your old mains. I believe a high pressure system, going into a small city of 10,000 people where they haven't a gas pipe in the town, that high pressure is all right, for the reason that you can lay small 2-inch mains, and if necessary you can lay ¾-inch services. Mr. Dewey has expressed my opinion exactly.

Mr. Traver—I think I can furnish Mr. Hellen with all the men he wants who can put on these governors at the rate of 16 a day. In some instances our fellows are averaging over 10, in the worst cases, of these little tin case governors, and we can put on 20. Each of these governors is installed with a vent and you can put them up in no time; it is no trouble at all. As far as carrying this pressure of 3 pounds or 4 pounds, or any other amount of pressure on your diaphragm is concerned, the governors are not designed to carry the pressure of the main or of the service. The valve works against the inlet pressure and the diaphragm is given power by the house pressure, therefore the only pressure on your diaphragm is the house pressure, whatever that is set for—25-tenths or 35-tenths, whatever you want. There is no

high pressure on the diaphragm itself. I can say that this is not a makeshift arrangement.

Mr. Hellen—I believe no governor should be placed on the outlet of a meter without a shelf under it, it is a weight on the meter. That is also another extra expense.

Mr. E. P. Lloyd—One point has not been brought out in this discussion. Suppose that under Mr. Traver's system, taking existing mains as they are, which I believe he does, and increases the pressure at the works, there may be one or more districts of the city subjected to an unusual demand which was not contemplated as being a proportionate demand at the time the mains were laid; let us say that a factory requiring a large gas engine or otherwise would be located at some point where the mains were comparatively small. Now, if I understand it correctly, he would have to carry, in order to get the pressure to that particular point, a pressure over his entire system of distribution, whereas with the booster system it would be possible to cut into that point and not carry an excessive pressure over the general distribution for the supply of a particularly weak point.

Mr. Traver—Replying to Mr. Lloyd, I do not know of any booster system in which these low points have been worked out, that is, where they are liable to occur. If you have to increase your mains that are now in the street, you can do so very easily. If that comes suddenly increase your pressure over the whole city, take pressure surveys and find out the most economical point to put in the larger sized main and take care of that. I think you can find out in most cases on a very short stretch of main will do this; that is, you can find a big drop in a very few blocks on your regular main. Now, your booster system has to be originally outlined to go to these low pressure areas. You may strike those and then again you may not. I think in 9 cases out of 10 you won't strike those; then you have to bring your booster system to that particular point before you can cut it in.

Mr. Lloyd—But with a very much less leakage and thereby loss, can you not increase the pressure on a special high pressure line and thereby get your distribution, rather than losing so much through an increase of pressure or the additional cost of laying unnecessary mains to supply that weak point? The quest has been raised that increasing the pressure would increase materially the cost. Unquestionably the higher the pressure the higher the cost of distribution, and that increased cost must be offset against the decreased investment in the comparatively smaller pipe. In other words, the high pressure booster line with no consumers off it, unless they were specially large consumers where they would be treated as a district, would be flexible in the sense of allowing you to increase your pressures very greatly at comparatively small increase of cost, because they would be originally designed for the carrying of high pressures, which ordinary main distribution is not. Again, there would not be the great number of possibilities of trouble in the very large number of small regulators, the giving out of any one of which affects the consumer immediately, and possibly dangerously.

Mr. Traver—Yes, but supposing you have to put an increased investment in—you do so at a time when you need it, not at a time when you don't. If you lay out your system now you have to take into account all these future demands on that system, and you have to put in your money right now to take care of something 20 years from now, if you are going to provide a system for that length of time, or whatever time you are going to have it cover, and then at that time you have to start over again and put in a larger booster. On the other plan you make your investment just as you need it.

Mr. Lloyd—What are you going to do when you get to the maximum of your system?

Mr. Traver—Then I am going to find out the line on which I have my biggest drop, and if I have to I will put in a larger line, or else put in a parallel line to help that out.

Mr. Lloyd—You are still getting in a good deal of pipe, but you are putting it in when you need it; you don't put it in 20 years ahead of time.

Mr. Lloyd—Would it be 20 years—would it be 15 by experience?

Mr. Traver—I think it would be. If in 5 years or in 2 years from now you must put in a larger pipe, you can afford to do so, but you cannot afford to do it now.

Mr. Lloyd—You have reconstructed your booster system 3 times in 3 years, haven't you?

Mr. Traver—No, sir; the first thing was a makeshift arrangement; there is no question about that.

Mr. Lloyd—What was the second?

Mr. Traver—The second, which was also a makeshift arrangement, was done before we knew much about that part of it. That was not the system, because our holder would not throw pressure enough. It was not a question of a design or an idea for a booster system or anything of the kind. We had the mains here; that was the end of it. As far as I was concerned I did not have anything to do with saying whether we should put in larger mains or anything of the kind; I had to get pressure enough out; the main pressure had nothing to do with it. Last year we started on a distribution system, and that is the system we are going to keep up. Those little experiences in the first were simply things that came on us unexpectedly and which we did not anticipate at all. We simply had to get over them. The cost of those things did not amount to anything. The little exhauster that we put on in the first place is now pumping water gas—we had to have one anyway; it was simply a question of buying it a year ahead of time. As far as the turbine blower is concerned we are now using that.

Mr. Lloyd—Didn't you put in the regulators?

Mr. Traver—This is the first year we put in regulators.

Mr. J. C. Sloan—One thing in favor of the booster system which occurs to me is that you would only have to increase the pressure on a small amount, or required to keep up your pressure at a given place, it might not be more than 10 per cent.; if you have a high pressure line of all your mains, you have to have it all over and it raises the cost to that possible extent. If you increase your consumption 10 per cent. you probably would have to raise your pressure very much at the works, where if you had a booster ssystem you would only have to pump 10 per cent. or increase the pressure on 10 per cent. of the gas you were sending out; the rest of the holder would send out without any expense.

Mr. Traver—That is a question of cost. If you can afford to pump all your gas for a small portion of the day, you can usually better afford to do so than to put in a booster system and only use that 3 or 4 times a day. A case has just been called to my attention that I forgot to speak about. St. Louis has probably the most recently designed booster system in the country, and I have just found out in the last week or two that St. Louis is putting regulators on nearly every service in the town. St. Louis is not following Grand Rapids' example, we may be following theirs; at any rate the two are identical.

Mr. Hellen—St. Louis in any part of her mains is not carrying to exceed 7 or 8 inches, as I understand it, and there is a great deal of difference between 7 or 8 inches and 2 pounds. Anyone who has inspected gas mains under pressure for leaky joints before they were covered up, either lead or cement joints, knows there is a great deal of difference between 7 and 8 inches and 2 pounds. I have seen cement joints that would hold under 10 inches, but under 2 pounds we had to dig them all out again. That was before we covered our cement joints up on account of the difference in temperature, or before we made them as we do to-day. St. Louis cannot be compared to this place at all.

Mr. Traver—I think St. Louis has put 5 pounds on part of her system if I remember right. I think her booster system is all under 5-pound pressure.

Mr. Hellen—Yes, her booster system is all 5 pound pressure; but where they are putting these low pressure regulators on it did not exceed 6 or 7 inches. You do not seem to appreciate the question of leakage; the leakage under 7 inches and 2 pounds is altogether different. St. Louis is taking care of its high pressure with its booster system and they are not putting on regulartors where you think they are. Only a short time ago a party who came from there said they were putting in regulators where they are opening up into their low pressure, and they have to carry a pressure of 7 inches to the outer parts. Now, as I said before, it is a question of 7 inches. Mains will not leak under 7 inches in some cases where under 2 pounds they would kill every tree in the neighborhood.

Mr. Traver—If your leakage is going to be excessive put in something else, either a larger main or something to keep you from carrying that high pressure. You will find, as far as either 2 pounds or any other number of pressures is concerned that it won't be uniform all over the city; it cannot be, and it is only for a very short time. In the last 4 years we have probably increased our pressure 150 per cent., and have not as yet found any difference in our leakage. This leakage question is only for a very short time. Your maximum peak hours are only a very short time, a very few hours in the day, a very few months in the year.

Mr. Hellen—Yes, but you take a leakage in covering, such as we have in Rochester, gravel, rocks and the like, and you have to consider it if it is only for one hour in the day; if there is a leakage out in the street it will get back and kill the trees, which is one reason that you must consider this leakage. It is more than you think for. I laid a 16-inch gas main in Detroit. We had in about 600 feet of it (these are actual facts) and I tested it under 10 inches pressure. It did not leak. I

increased that to 15 inches and it started leaking; but when I got up the 2 pounds pressure you could hardly hold the pressure on the line—I probably carry that a little bit to extremes, but there wasn't a joint that was not leaking. Now if that was a question of low pressure under the 7 inches, why you would not have had a leakage, but when you run her up to 2 pounds pressure, which you are going to do under your low pressure here, there you have your leakage. Leakage is an important thing; I know it is with us.

Mr. H. Russel—This is a good discussion. It occurs to me that may-be the St. Louis system is pretty good; they have both the high pressure booster belt line and the service governors. It seems to me they have struck a medium line between these two systems. It looks to me largely a question of leakage, and I would like to ask Mr. Traver whether his mains are not laid exceptionally deep and well. In other words, whether he cannot carry in Grand Rapids a higher pressure on his low main distribution system than it would be safe to carry in most cities. I would also like to know whether he thinks he could economically carry 1 pound or 2 or 3 or 5. If he can carry 5 pounds on his low pressure system safely, then obviously he must have room to grow for a considerable length of time. If he can only carry so many inches, then his system is only temporary and cannot be anything else.

Mr. Traver—I don't know whether they are laid any better than any other mains or not; they are pretty good mains. There is this much about it, the St. Louis people certainly have an ideal system; but they also have a lot of money in it. I think they have more money in that system than almost any other distribution system I know of. But I don't think it is a question of simply inches on this system it may be and it may not. It is a question of how they come out eventually in the cost, how much this leakage does amount to. If the leakage does get excessive, if it is going to cost us more to fix the joints right, we could afford to dig down in the so-called high pressure area around the works; we could dig down to every single joint there and fix them right, to carry pressure high enough, for a good deal less money than we could put in the booster system clear out to the ontskirts to take care of this same situation that this high pressure would take care of. It is simply a question of money. I do not claim that that is going to put off the investment of money in mains always, but it is going to put it off until such time as it is needed and then only put in just what is needed, not put a lot of money under ground that is way ahead of the time and not needed now.

The Chairman—On behalf of the Association I wish to extend to Mr. Traver our sincere thanks for this very interesting paper. The discussion has been very profitable. The next paper on the programme is that by Mr. Richard Schadellelee, of Grand Rapids, on the

VALUE OF SYSTEM IN THE MANAGEMENT OF GAS COMPANIES.

In the absence of the author the paper was read by Mr. H. C. Morris. [For the text of the paper see JOURNAL, Sept. 24, pp. 536-37-38.]

Discussion.

The President—We have heard a very good paper, one filled with good things. We should have a very good discussion on it. I will call on Mr. Knight.

Mr. J. J. Knight—I do not think it possible to discuss this paper other than to say it is all right. I was thinking during its reading how we could discuss it.

Mr. Shacklette—I am in the same boat as Mr. Knight; I don't know what to add to it. One thing we might make a point of is a house-to-house canvass for the small troubles of our present consumer, as well as new business. We would like to do that two or three times a year, but so far we have not found time to do it oftener than once. It is a regular systematic canvass for such troubles as may be found or suggestions that may be offered by the consumers, and is made either by our best fitters or by solicitors. We thus find many little things to which our customers would never call attention; incidentally we get many orders along with it.

The President—Mr. Chamberlain will read a discussion sent in by Mr. Ritter, who is absent.

Mr. Chamberlain—The Ritter discussion is as follows: Your President has asked me to criticise Mr. Schadellelee's paper. I read the paper over twice hastily and am, therefore, not qualified to go into a detailed criticism. My criticism is based on the impression left by the paper after laying it aside for a while. System as a principle is not new; it is as old as the oldest Egyptian pyramid—without it we would not have had a pyramid. It is the result probably of the best system possible with the state of science at the time. If it were to be rebuilt to-day it might be constructedat less expense of life and labor, but this would not be because of a better system, rather because of the advance in science. This takes us back to the old proposition, "Which came first; the hen or the egg?"—system or science. Getting down to more recent times, Franklin was probably an extremest as an exponent of system. You are probably all familiar with the 13 virtues adopted by him to regulate his own conduct. Among them are, "*Order*—Let all your things have their places; let each part of your business have its time. *Frugality.*—Make no expense but to do good to others or yourself: *i. e.*, waste nothing. *Industry.*—Lose no time; be always employed in something useful; cut off all unnecessary actions. *Moderation.*—Avoid extremes; forbear resenting injuries as much as you think they deserve. *Tranquility.*—Be not disturbed at trifles or at accidents common or unavoidable." These and others of Franklin's 13 virtues constituted his "system." I think it is safe to say that every gas man recognizes and will acknowledge the value of system. Each believes he has a good one; the best one perhaps. It is a good deal like flaunting a red rag in front of a bull to tell a gas man his system is bad, or to ask him to change it. Diplomacy is necessary when you criticise a gas man's system. "Man should be taught as though you taught him not; and things unknown proposed as things forgot." Recent advertising has brought the word system into narrow and more confined construction than really belongs to it. Mention "System" to a gas man and he has a mental vision of card indexes, loose-leaf ledgers, Macey's cabinets, etc. He is a victim of the psychological law of association. He has associated pictures in magazines and talks with advocates of these new ideas and received his impression from them. We all admit that system is desirable to the fullest extent that the word can be applied, but give us one concrete example where our system can be changed advantageously and more is accomplished than by papers giving only generalities. If a friend invites me to dine with him, more than likely I will say, "Yes, to be sure, I will be glad to," and then I proceed to forget it. But if he asks me to dine Thursday, at 6 P.M., he compels me to say yes or no, and he will produce results. When a gas nan is told the value of system in his business, he is bound to agree that it is necessary, but at the same time he has a submerged opinion that his system is good enough for him. But tell him your meter readers are averaging 320 meters per day, at a cost of .6 of a cent per reading, and he will "sit up and take notice." You tell him your readers are assigned certain routes which are not changed, that their salary is in proportion to the number of meters they read, that they are well paid and only work 8 hours per day. If he is as bright as you give him credit for being, he will think it over and more than likely try our system. System is all right; we can't do without it. But it must not be confounded with "red tape." It consists mainly of "Doing the right thing at the right time with as little expense of time, energy and money consistent with the quality of the thing produced." What we really want to know is, "How to do it and how to know we have done it when we have." Give us some concrete formula to apply in perfecting our system and let that formula be the result of experience. [Applause.]

The President—I think Mr. Schadellelee brought out a very good point in his paper when he said, "Time and money spent in keeping present customers satisfied are even a better investment than time and money spent in obtaining new customers." I think a good many companies lose sight of that. The best advertisement we have is a satisfied customer. On behalf of the Association I take pleasure in extending to Mr. Schadellelee a vote of thanks for his interesting paper.

The Secretary announced the receipt of an invitation from the Librarian of the Grand Rapids Public Library, asking the members of the Association to visit the building. The meeting was then declared adjourned until the next morning.

SECOND DAY—MORNING SESSION.

The President—We will now listen to the paper on

THE REMOVAL OF NAPHTHALINE FROM COAL GAS,

by Messrs. Alfred H. White and J. M. Barnes. Mr. Barnes is the holder of the Gas Scholarship maintained by the Association in the University of Michigan.

[For the text of the paper see JOURNAL, Oct. 1, 1906.]

Discussion.

Mr. Blauvelt—As I have not had time to thoroughly digest this paper I am not really prepared to discuss it at all. I can say I have been extremely interested and feel that the gas fraternity owes a very great debt to those who worked so earnestly and faithfully in preparing the paper, and it is for us all to take it home and see what we can do to

overcome naphthaline difficulties with the light which this investigation has shed on the subject.

Mr. V. F. Dewey—I do not care to discuss the paper, I am not at all familiar with the work that is being done or which has been done in our plant. I only note the extreme accuracy with which this work is being done. It would seem to me the further we go, or the further the scholarship which is carrying on this work goes, the more accurate they are becoming and the more they appreciate the difficulties of the situation. I certainly was surprised at the apparently little effect the centrifugal had over the ordinary P. & A. I expected considerably different results. Perhaps we will come back to the old system employed in the European plants of a much slower traveling gas and larger primary condensers, as it is the conclusion apparently, as far as I can make out, in all the papers on naphthaline presented that the prime element is a most important one and that instead of cutting down that time element, as the manufacturers of apparatus have been trying to do in this country, they will have to increase it, even if it does mean a larger outlay and expense in the construction of our works, although they have had naphthaline troubles over there and a lot of it. The only way they have been able to overcome it is by a naphthaline absorbent placed after the primary condensers.

The President—Mr. Knight, have you anything to say on the subject?

Mr. Knight—I cannot discuss this question from an engineer's standpoint, but am very proud of this Association. I believe it is the best one in the United States just now—the best State Association anyway. (Applause.) The work that it is doing is noted apparently all over the world. It seems to me perfectly practical to erect a small experimental gas works at Ann Arbor to help out on this investigation. I would like to have that discussed.

The President—Mr. Douglas can tell us what has been arranged for in that respect.

Mr. Douglas—After our last meeting it was proposed to erect such a plant as Mr. Knight suggests, and through the courtesy of a number of gentlemen the apparatus was all promised. The idea was to erect a bench with a single retort and a condensing system—in other words, a miniature plant; but after going into it and attempting to design it, we found it was a very difficult thing to do. Actual working conditions probably could not be obtained with a single retort, the expense of operating it would be large, and the time required in the actual bringing up of the heats, etc., would be a serious obstacle. So it was decided it would be better to connect the condensing plant with a single retort, or with 2 or 3 retorts, in our Ann Arbor works. Some of us had a meeting at Mr. Tippey's invitation yesterday and talked this over, and I think the apparatus has all been promised. The plan is to build a small structure at the side of our retort house (I regret that we have not room in the building for it) so as to connect in one retort of the bench with the condensing apparatus and put in a small condenser, exhauster and purifier. The condenser is so arranged that samples can be taken at any part, and any part of it can be cut out, so that the condition of any part of the condensing and purifying apparatus can be changed at any time. I hope this will be done inside of a month so that the apparatus will be in position to be used the coming year.

Mr. McKee—I understand that the general object of the paper is some simple method of treating the naphthaline trouble. I wish to say a few words about the paper and about how far we have progressed up to the present time in that direction. The question of the general effect of tar on naphthaline, the absorption of naphthaline in light and heavy oils, the effect thereof and kindred questions, are all matters treated of very clearly in the literature on the naphthaline question in the American and foreign JOURNALS. One of the points scored in the paper is the building of a very small tar separator, in which it is proposed to prevent contact of the gas with the tar. Now, in the diagram given, I believe you will note that the separator is a small drum carrying vanes. It is not mentioned whether those vanes are on the inside or outside of the drum. Assuming the vanes are on the outside, each cubic foot of gas, when that drum is rotating at 1,300 revolutions per minute, will be scrubbed over approximately 3,000 square inches surface of tar. It seems to me, instead of being an apparatus to prevent the scrubbing action, that it is about the most efficient device that could be designed to permit scrubbing action. Assuming on the other hand that the vanes are inside the drum, that a system of vortex currents would be set up through which the gas would descend through the outer part of the drum to the bottom in the clearance space and return up the center, a scrubbing action would go on just the same, probably not to such a great extent as it would if the vanes were on the outside. In regard to the errors in sampling. I remember that last winter or fall a gentleman had a large chart at Ann Arbor, which had been made at Detroit, of samples of tar from the P. & A. for us to look over. There were a very large number of inconsistencies in the results which apparently could not be explained, and I believe that Prof. White, who was good enough to come over, and myself, spent a half day threshing out the "why and wherefore" of these different things happening. It was pointed out in the course of the afternoon that it was probably due to sampling. I do not think throughout the paper enough stress has been laid on the errors due to sampling. Probably as you all know it was pointed out I believe 3 or 4 months ago in one of the JOURNALS that in gas travelling through a pipe, the outside 3 or 4 inches, depending on its size, is moving in vortexed rings, in somewhat the way you have seen smoke rolling; in other words, the gas in the middle of the main is travelling on roller bearings, so-to-speak. Now it is natural that the gas on the outside should be scrubbed against the tar deposited on the wall of the main, and the gas in the middle of a 24-inch main is travelling very rapidly (in the Detroit works probably at the rate of 6 feet per second). These gentlemen in taking their samples put the tube in just inside the main and evidently got the sample of gas where the rolling movement was going on. Now they attempted, in another part of the paper, a comparison between the amount of tar at the outside of the main and the amount in the middle. To take the sample at the middle of the main they simply screwed the pipe in so that its end was directly in the current of gas. If you consider from a mathematical standpoint just what happens when you attempt to take that sample of gas from the middle of the main, you have got a rate of flow in your ¾-inch pipe, 20 feet per minute, while in the center of the main the rate is probably from 5 to 8 feet per second, depending on the time after charging. The heavy particles of tar, moving so much faster in the main than they are in the sampling tube, will rush right by, whereas the gas alone will be drawn in the sampling tube. That is, the amount of tar estimated from the center of the main would be much lower than it should be. It seems to me the only accurate way of estimating the amount of tar in the center of the main is to put the inlet of the tube parallel to the direction in which the gas is flowing, and directly facing it, and then arrange for the rate of flow in the sampling tube to be equal to the rate of flow in the main; then the gas and tar and all will follow right into the tube. Otherwise I do not see how you can even get an approximate sample. I think the points brought out in regard to sampling cover the tar question very thoroughly and show that it has been almost impossible to get even an approximate sample or to draw any fairly approximate conclusions from the results that have been worked out in the tar question. So far as naphthaline goes, I believe they state the results on naphthaline could be relied on as being accurate, but I want to take just one exception, that the naphthaline is given off at the latter part of the burning off of the coal, probably during the last 2 hours before our charge. In the tests that were taken it is not specified clearly just when the sample was drawn off. It may have been drawn off right after the charge was put in, or during the last half or the middle half, which would vary, it seems to me, very considerably the amount of naphthaline. I am not sure that that precaution was not taken, but I don't remember seeing it noted in the paper. I appreciate very thoroughly the amount of work that has been done and the attempts made, and I believe we are moving in the direction of truth. But the advisability of attempting to sample a fraction of gas from a large main I think has been gone into very thoroughly in the old country, even in setting up one or more experimental retorts. The subject has been threshed out several times, and I think it would be advisable to go thoroughly into the literature of that matter before making any attempt to set up an apparatus or attempting the next year's work.

Mr. Blauvelt—One point I would like to bring up or rather a question. The statement is made, "Carrying the subject a step further, a pitch was next tried, and as an extreme case a hard and brittle pitch was chosen." Now, hard and brittle are relative terms, of course, with regard to pitch, and I think it would be a matter of great interest to us all to know what the melting point of that pitch was, and whether it was so high that under the conditions of the test when the gas entered at various degrees (122° F., 156° F. and 194° F.) at that temperature there was any melting of the pitch used in the test tube, or even whether any softening and tendency to run together manifested itself. If the pitch were so hard that nothing of this sort occurred, does it not indicate that the use of a sort of a pitch-filter, if I may use that expression, made up of hard and brittle material, ground and laid on trays, would be a much better device for the removal of naphthaline, rather than the pumping of the dead oil of tar which already contains considerable naphthaline, such as is used in some European works?

Prof. White—In answer to the last question by Mr. Blauvelt, I have not the exact melting point of that pitch where I could get it, but it

softened in every case so that it had to be broken out of the tube. It would not shake out after it had been heated up and mixed with sand, and I do not think a pitch that was entirely hard would have acted to the same extent as that that was melted soft, although you might have had the action of free carbon pitch which would not have been masked by the amount of hydrocarbon incorporated with it. I am not entirely sure. I think Mr. McKee has set forth the difficulties experienced in working in the gas works perhaps more vividly than they were set forth in the paper, but I think his remarks about the difficulties are all those which have been appreciated by us. We had to work under existing conditions; the only thing to do was to get the best results we could with the means at hand. That we did to the best of our ability, and we have refrained from going too much into explanation of a good many figures because we did not have any explanation to give. We could simply say there was in all probability an error in sampling to account for it; which was the most we could say. We believe and hope, when we come to working with the experimental plant, we can control those variables to such a degree that we can reach conclusions, where at present things seem to be very much tangled. There is not much doubt that the proper way to remove naphthaline is to get it into the tar and then remove the latter. I guess the tar removal could be accomplished if it were known to be desirable; but the question of determining how to get the naphthaline into the tar is a more difficult one to solve because we know it is a product or function of at least three variables—time, temperature and surface—and almost any change made in the works will involve a change in all three variables. I think the guess of one man is about as good as the guess of another as to which one of those three, or whether all three variable have been concerned in the result. The great difficulty about the whole thing is there are so many different variables which we cannot control. We can control nearly all of them through an experimental plant, and I feel greatly pleased, as we all feel at the University, at the compliment which has been paid to the work done by this Association from year to year in its support of the fellowship, and in the especial compliment which has been paid to us at this meeting of practically officially recognizing that the work done has been of such value, so that it is desirable to continue it under more advantageous circumstances. On behalf of the University, as well as personally, we desire to express our deepest thanks to the Association, and to the individual members who have personally supported the work, for the assistance in these past years. [Applause.]

The President—We will now hear the

REPORT OF COMMITTEE ON PRESIDENT'S ADDRESS.

Mr. S. E. Wolff—Mr. President, while we do not quite concur in all the recommendations embodied in the President's address, and while I did not discuss it with the other members of the committee, I am quite sure they will agree with me when I say that we will be glad to have a full and free discussion of the report. The report is as follows:

Your committee to whom was referred the President's address begs to report that it most cordially indorses the recommedation for the appointment of a permanent committee of 5 to look after the Gas Scholarship work. It would recommend that this committee consist of: (1.) A member of the faculty of the University of Michigan; (2.) a holder of a University Scholarship in gas engineering, employed by a Michigan gas company; (3.) two members selected from the engineering corps of Michigan gas companies; and (4.) one member selected from the commercial staff of a Michigan gas company. This committee to hold office for 1 year, and to be annually selected in the same manner as provided for the selection of a Vice-President of the Association. We would further recommend that for the ensuing year the committee should consist of Messrs. A. H. White, A. F. Traver, F. L. Cross, H. W. Douglas and J. T. Lynn.

We heartily indorse the second recommendation of the President, suggesting the appointment of a committee to get up instructions covering all dangerous points of our business—as far as practical such report to be of such character that it may be issued to gas companies for public posting and for distribution among plumbers and others similarly connected with the business.

We further commend the suggestion that this committee should point out, impersonally, what it considers false in present methods, and should recommend remedies, embodying these observations and recommendations in a supplemental report for private and confidental distribution. This committee to consist of 3 members to be appointed by the incoming President.

On the subject of company membership, the Association has already authorized the continuance of the committee last year appointed on this subject. We believe that it is one of the most important questions before the Association, and that some definite recommendations should be made by that committee not later than the next meeting, so that the companies represented in the Association may be prepared to take active steps to protect any interests that may require it before the constitutional convention, which in all probability will be called in this State in the near future. Respectfully submitted.

S. E. WOLFF,
B. O. TIPPEY,
E. F. LLOYD,
} Committee.

On motion of Mr. Wolff the report was adopted.

The President called for the

REPORT OF COMMITTEE ON MEMORIALS,

which was submitted as follows:

In Memoriam.—Mr. William T. Arnold.

Whereas, Our membership has been lessened by the death of our late fellow, Mr. William T. Arnold, for many years an employee of the Saginaw City Gas Company, it seems highly fitting that a few words be said in his memory and that a resolution be passed expressing our loss and sorrow.

Mr. Arnold died in Saginaw, November 1st, 1905, after some 7 weeks of great suffering. He was a young man, not over 40 years of age, born and brought up in Saginaw, which place he had always made his residence. He was always ready, always true, and it was a pleasure to call him friend. For many years he had been in the employ of the Saginaw City Gas Company, and for the 3 years previous to his death had faithfully and acceptably filled the position of Superintendent of the manufacturing department.

He enjoyed much personal popularity in the city of his residence, and although not widely known in the gas fraternity, he was loved and appreciated by those whose good fortune it had been to meet him. He had gained some prominence in the public life of his city having served of alderman for several years, and later on as supervisor for his ward. Therefore, be it

Resolved, That this Association in its deliberations express its sincere regret in the death of its loved member and extend to his widow and family its consolation and sympathy.

Resolved, Further, that the Secretary of this Association be directed to mail a copy of this memorial and resolution to the family of the deceased.

The President—If there is no objections the report is ordered adopted and recorded in the proceedings. We will now hear the

REPORT OF COMMITTEE ON NEXT PLACE OF MEETING.

Mr. Knight reported that the Committee have agreed to recommend Kalamazoo.

Mr. Persons—Perhaps the committee has not taken into consideration the fact that we are going up to the "Soo" next time. I don't want to make any motion contrary to the report of the committee, but ought not we to consider the "Soo?"

Mr. Knight—As far as I can learn the only men who really think the "Soo" to be the place for us are Mr. Persons and myself, in view of which fact we thought it better not to take any time discussing that question.

On motion of Mr. Douglas the recommendation of the Committee was adopted and Kalamazoo chosen as the place for next meeting.

The President—We will now hear the

REPORT OF THE NOMINATING COMMITTEE.

Mr. H. W. Douglas, Chairman of the Nominating Committee, reported the following list of office bearers for the ensuing year:

For President.—Mr. V. F. Dewey, of Detroit.
For Vice-President.—Mr. D. H. Fraser, of Battle Creek.
For Secretary and Treasurer.—Mr. A. P. Ewing, of Detroit.

ELECTION OF OFFICERS.

On motion of Mr. Wolff the Secretary was instructed to cast the ballot of the Association for the officers named, and he acted in accordance with the instruction.

TWO RESPONSES.

Mr. Dewey having been called upon for a speech, responded as follows: Mr. President and Gentlemen of the Michigan Gas Association: I certainly appreciate this honor. I do not know of any greater honor that can come to a gas man than to be President of your Association The work the Michigan Gas Association has been carrying on for the past few years has been attracting the attention of the gas fraternity throughout the world. This has been due mainly to the magnificent work of the Michigan University, supported as it has been very loyally

and ably by the gas men of Michigan. The coming year I believe will increase the work and the opportunity for work in that direction. I think it behooves us as gas men to still continue our support, and increase it if possible, to make the Michigan Gas Association strictly a Michigan Association, to carry on the magnificent work we have started. I certainly ask for your support the coming year, and trust that the meeting to be held at Kalamazoo will be the best; and if we can make it better, let us try to do so. I trust the character of the papers to be presented at that meeting will maintain the high standard that has been set in the last few years. I thank you for the honor.

Mr. Fraser having been called upon to make some remarks responded as follows: Mr. Chairman and Gentlemen—About the only thing I cannot do I think is to make a speech. All I can say is I thank you for the honor you have conferred upon me.

There being no further business to come before the Association, the meeting was declared adjourned.

[OFFICIAL REPORT.—REVISED BY THE SECRETARY.—CONTINUED FROM PAGE 672.]

SECOND ANNUAL MEETING, IOWA GAS ASSOCIATION.

HELD IN DES MOINES, AUGUST 23-24, 1906.

SECOND DAY—MORNING SESSION.

Discussion on the Paper by Mr. George Warnking.

[For the text of the paper, see JOURNAL, Oct. 15th, p. 670.]

Mr. Waring—I would like to emphasize the fact, in connection with enlarging a plant, that the expense of purification depends more upon installation than operation. In other words, the old method of purifying, with the expensive purifier house and the boxes as described by the writer, is becoming obsolete. The cost of operating a purifier plant is practically nil. The interest on the cost of the old-style purifying plant is considerable. If we can cut down by the number of methods that have been suggested and also adopted when we go to enlarge our purifying plants, we will be surprised at the net result. I don't think it is worth while from a financial standpoint to spend 5 minutes on the discussion of operation or purification, but the construction or installation of a plant is a very serious problem; and I don't think the smaller works throughout the country have thoroughly grasped this new idea, which was originally suggested by Mr. Shelton some time ago in the cement box, and is evolved into the steel tank construction, both being out doors with merely a shed to keep out the rain and snow. I merely would like to mention that, to impress the men who have money to put into gas plants with the absurd (you might say) investment of putting in the old-style purifying plant.

The Secretary—I think one of the most interesting and important things brought out in this paper is in the last paragraph, with reference to the general inspection of the plant. I have found it very important to make, besides the general daily inspection, systematic weekly and monthly inspections of the most vulnerable points in the works. These are made by the foreman or head repair man or both, and they are absolutely responsible, and the record of them is kept in a book ruled out for 1 year. The monthly inspections include the examination of every valve in the plant. Each valve is turned far enough to see that it is in working order, and is oiled and packed if necessary. Every drip in the plant is equipped with a test pipe, and of course is pumped daily; but on this monthly examination the test pipes are examined to see they are in working order and that nothing has been changed that would cause a shut-off. The weekly inspections include the complete inspection of all the holders, and every casting and pulley. Another monthly one is a complete inspection of all the fire apparatus, which is run out and examined to see if it is in good working order and no parts missing. We have found this practice of inestimable advantage. Several times we found things that would not have been found if the inspection had not been made so systematically and minutely.

Mr. Chubb—I find that in plant operation one of the principal things is to have a daily report made out. If the results are extraordinarily good I get suspicious and examine the scales and all other apparatus to make sure there is no mistake. The monthly checking of the stock on hand is another very important question. Many times your material is stored in piles and bins where it is practically impossible to get a correct measurement and weight, but in such cases I arrange to have every carload of material entered as it is received, kept separate if possible, and that car used up, keeping the original stock by itself and taking into account the discrepancy on each car. In that way you avoid a big discrepancy when you finally clean up your stock. For instance, the water meters and gas meters I have read every day, and if there is any extraordinary use of water or gas, I follow it up to see where it is. In that way in the year I have been there I have been able to cut down the water and gas bills. The first month I think the gas bills were running somewhere around $12 to $15 and the water $20 to $30. My water rent now is sometimes only the meter charge, which is $1 for city water (we pump our water from the river); and the gas bills are never over $2 a month. That is done every morning and it doesn't take much time, but such little things cut down expenses.

Mr. Waring—I think this question of inspection and period of watching results will depend largely upon the size of the plant. In other words, I don't think we ought to make too much clerical work of a very small plant; we can't afford to pay the cost. Sometimes by the employment of an extra clerk we can't declare a dividend. In a large plant we can afford to pay a man $100 a month to watch results and do nothing else. I don't think we ought to lay down any rule, but should use more or less discretion in mapping out a system of reports. The report referred to by Mr. Chubb would be all right for Sioux Falls, but at the same time it would probably be inadequate for Des Moines, and the Des Moines system would be too expensive for Sioux Falls. I think we should look carefully into that problem. In some plants I don't think it pays to figure up results more than once a month.

Mr. Mitchell—At Waterloo we keep a daily report, which is a great deal along the line of Mr. Chubb's talk, and on it we figure our yield on the coal used and also any part of the machinery that may be wrong in any way. It is not left to a man's memory; it is put down on the report. These reports are filed every month and, of course, entered in a book. We take our stock every month; it is pretty hard to approximate it any oftener. We had some 600 tons of coal on hand when we thought we were going to have a strike, and couldn't tell exactly how much we did have. I would like to ask Mr. Warnking, in regard to air for purifiers, about how much air you can take in to revivify your oxide during the process of making gas?

Mr. Warnking—From 1½ to 2 per cent.; never more than 2 and never below 1½.

Mr. Mitchell—About how much will that revivify?

Mr. Warnking—That depends largely, I think, on the size of your boxes. We can fill our boxes and have them last 1 year, but we don't let them run that long; we change every 6 months. Of course, if you had smaller boxes you couldn't do that; you would have to change frequently. That is the trouble in most of the small plants; they haven't sufficient purifier capacity. I have known some plants where they had to change every 2 or 3 days, because their boxes were so small.

Mr. Averill—Mr. Warnking, how much water do you use per 1,000 feet in the scrubber?

Mr. Warnking—From 40 to 50 gallons.

Mr. Averill—We have a water meter under our scrubber and find we use about 2 gallons to the 1,000.

Mr. Warnking—You don't use any ammoniacal liquor?

Mr. Averill—Yes, we pump over all the time.

Mr. Kelley—What per cent. of ammoniacal liquor do you use?

Mr. Averill—From 1½ to 2. Do you take the lids off your boxes and revivify in that way?

Mr. Warnking—No, sir; we empty the box.

Mr. Averill—You never make any changes except when you empty them?

Mr. Warnking—We reverse them.

Mr. Averill—You use 3 boxes at a time?

Mr. Warnking—No; 2.

Mr. Kelley—Does Mr. Averill pump the water into the washer from the scrubber, or does he re-pump any of the liquor?

Mr. Averill—We have a water meter on the fresh water supply, and there is a flushing tank. We aim to regulate that so it will take in about 2 gallons per 1,000 feet of gas. That is pumped from the final scrubber into the first one, and then goes from that into the wash box. We try to keep the amount of fresh water used as low as possible, so that our weak liquor will be as strong as possible.

Mr. Kelley—Your fresh-water liquor when it comes through your first scrubber is 1½ to 2 per cent.?

Mr. Averill—Not on the first scrubber; that is on the final. I think the great trouble with small works is in their purification. Our works were very small when we started with them, and our trouble was always with our purifiers. It is economy to have purifiers at least double the capacity that you want to use. We change our present purifiers about once a month.

Mr. Kelley—Since the discussion has reached the point of purification I would like to mention, first, that in the average small works

not enough care is taken with purification by water or in the washing. For instance, where they have a flush box they generally rely on the city pressure to supply that water, and have no means of telling, as a rule, how much water they are putting into that scrubber. I would suggest it would pay any works to have a meter on the fresh water supply. They could measure accurately then the proper amount of water. They have to do that if they are saving their ammonia. The cost of a meter is something like $10 or $12, and it will measure accurately the amount of water used at all times, whether they save ammonia or not. In the matter of purification, I can't understand why anybody can't introduce air into the boxes without danger of explosion or without materially reducing the candle power. One and one-half per cent. of air will make no material reduction in the candle power of gas, and it can easily be brought up in the coal plant by the use of a little oil, or in the water gas plant by enriching the water gas a trifle.

Mr. Waring—Mr. Averill says that purifier boxes should be twice the capacity rather than be too small or near their capacity. It might be interesting to this convention that Mr. Averill name the capacity of a purifier box. I think his point very well taken, and if we are going to enlarge our purifier plant we want to know what the capacity is. Knowing how much gas we are to make we want to know what size to build the boxes. We don't want to have to pay a consulting engineer to come from New York to tell us what size to build our boxes. We ought to know that ourselves. I think that would be very valuable information to have—just the capacity of a bushel of oxide under ordinary conditions, with Youghiogheny coal we will say, or ordinary water gas.

Mr. Averill—In figuring the capacity for purifiers when we had to enlarge, we figured the rate of travel of the gas through the oxide. I don't remember the exact figures. It was a couple of years ago that we figured it out. We then got boxes that were about 50 per cent. larger than our figures called for. We pass the gas through 12 feet of oxide, 3 boxes, 4 feet in a box. The boxes are 22 by 30, with a 16-inch connection.

The President—Mr. Springer has had a good deal of experience in small plants. Can he suggest anything that would help the small plant out?

Mr. Springer—Well, if I were going to suggest the cause of the trouble that the average operator of a small gas works has, I would sum it up in one phrase, "Incompetency," and that is what I recognize as being the great advantage of an Association of this kind. The average operator of a small gas plant attempts to do business in a haphazard manner, and that is what I mean by saying that incompetency is largely the cause of the troubles. To answer the particular question just asked, in reference to the capacity of a purifier, I am not prepared just now to give my exact authority, but I do recollect the figures. I believe it was from a paper read before the American Gas Light Association. In figuring the purifying capacity for small plants we take the anticipated consumption, figuring the capacity on the basis of 1 cubic foot of oxide purifying 1,440 feet of gas in 24 hours. Then we just double the capacity of the anticipated output of the plant in order to get what we consider a safe operating basis for future extensions of the business. I am sorry I haven't the address of the author of that paper, but a copy of it was handed me by a very eminent engineer, and he referred to it as being very high authority. It was read before the American Gas Light Association some 5 or 6 years ago.

Mr. Tenney—I don't feel competent to teach these gentlemen. I came in at the invitation of Mr. Vincent only to be taught. We have had same experience in connection with the installation and operation of small gas works; in fact for a number of years that has been our hobby. One of the worst things to be contended with as we see it is poor scrubbing and condensing and the fouling of oxides. In working along the line of overcoming these, we have been building a purifier which is simply an upright tank, in porportion to the size of the plant—never less than 5 feet in diameter, and running to a height of 10 to 16 feet. In it we arrange trays each having a clean-cut door, which is simply an ordinary casting rivited to the steel shell of the purifier. The bottom of the purifying tray comes flush to the bottom of the door. This door is packed with asbestos packing, filled full of wire gauze or copper wires, which is found to be thoroughly reliable gasket. We fill these trays from the upper doors, putting the purifying sponge in above. The bottom tray is filled with ordinary wild, prairie hay. Passing the gas through this wild hay first, renewing the latter every four or five days, we reduce materially the necessity of changing the sponge in the purifier, and are getting very good results.

Mr. Vincent—I would call your attention to a question still unanswered, or which has not been definitely settled, relating to the amount of oxide to use. Mr. Averill used the factor as area of the oxide through which the gas passed, which is the old method and as given by some of our standard authorities, but which was applied particularly to boxes where the depth of oxide was very much less than the depth as now used. That factor was to allow a square foot of oxide for a certain rate of flow. The old depth was from a foot to 2 feet. Purifiers are now often made to hold 7 or 8 feet of oxide; so that it would seem that we have to have a factor more on the nature of that introduced by Mr. Springer, of a cubic foot of oxide to so many feet of gas for 24 hours. I think Mr. Springer's factor of 1,440 cubic feet per 24 hours is rather high, even with water gas from a very low sulphur coke, and an examination of the capacity of boxes in use will show that that is probably double the figure generally obtaining in deep boxes for water gas. Of course we always have to keep in mind how many boxes we have in use. If we have a set of 4 of which 3 are in use and 1 idle, the capacity of the boxes would have to be figured on the cubic contents of 2 boxes, because the test is made at the outlet of the second one.

Mr. Chubb—I would like to ask if in figuring this 1,440 cubic feet is an average for 24 hours?

Mr. Springer—Yes. That was the basis given in the paper, and was calculated on 1 cubic foot of oxide purifying 1,440 feet of gas in 24 hours. As I explained, we just doubled that in our estimate. Now it is possible my memory does not serve me right on those figures, but I think I have them exactly right.

Mr. Chubb—The point I want to make is, if that 1,440 feet were pumped in 12 hours, the capacity of the boxes would not be the same as if pumped in 24 hours.

Mr. Springer—We make that calculation always in figuring the capacity of our purifying boxes, for we never anticipate more than a 10 hours' run in our small installations, not anticipating that in any small town we will ever have occasion to run for 24 hours.

Mr. Waring—When he operates his small plant without exhausters he is putting through at times more than twice the rate, on account of the make of water gas being larger the first minute or two. In other words he is probably putting through the first minute of his run three times the amount of gas rate that he is making in the 24 hours. Therefore, if he is figuring on his 24-hour basis and only doubling it he will get into trouble. In other words, with a relief holder he can use one-third the purifier capacity that he can without a relief holder. I would like to state that while my question was not a "catch" question, you can't figure definitely on the amount of purification per bushel unless you take into consideration the different fuels and oils you are using. In other words, if you figure on the basis of Youghiogheney coal and use Kansas oil, you will get into all kinds of trouble.

Mr. Springer—Answering the suggestion as to the increased capacity required to take care of a water gas setting on account of intermittent production, it has been our habit for some little time to install principally what we call high pressure delivery and storage. We have found from experience that in the very large majority of cases it is the most profitable and the least expensive installation to make. With the high pressure storage we have but one holder, which we call a relief holder. The gas is made and run through the hydraulic seal or wash-box into the condenser and scrubber, from that into the relief holder. We couple the compressor on to the same engine which runs our blower, draw the gas from the relief holder through the purifier into compression tanks, deliver the gas from that compression tank through a station governor or multiple of governors, which sends it to the mains at whatever pressure is necessary or we desire to carry in them. The trouble spoken of is thereby obviated, by having a constant and uniform flow of gas through the purifiers, so we can figure our purifying capacity very safely. I might say that in our installation purification is the least of our troubles.

Something from the Entertainment Committee.

Mr. Keffer—A part of the entertainment in which you are all interested is the banquet to be given this evening. Last year we were quite successful, but this year we are sure the banquet will be much more successful. I am assured that the Governor will be with us to-night. I also am informed that our good friend Col. Lafayette Young, of whom some of us have heard, will be with us; also Mr. Harvey Ingham, Editor of the "Register and Leader." We are to have an array of talent from an oratorical standpoint that simply cannot be surpassed in Iowa. Even over in Illinois they haven't anything that can touch it. The "spread" will be up to the usual reputation of the Savery Hotel. Messrs. Roper and Frank Maple, of Boone, are the other members of the Entertainment Committee having immediate charge of the financial end of the entertainment. Mr. Roper has the tickets "at $2

per." We do not want anyone to get away. In any event we want his money, whether he stays or not. I heard that Mr. Clabaugh received a call that it is desirable he should be in his own hunting grounds within the next 10 or 12 hours. He has never been with us before; indeed, he has not been in this town for perhaps 16 years, and then only for about half an hour, so we are especially anxious that he should stay. Not that we expect to work him for a speech or anything of that sort. We want his presence, and we know this event will not be the success that it ought unless he is present. Mr. Clabaugh is especially requested and invited to stay with us.

Mr. Clabaugh—I deeply feel the compliment paid me, but unfortunately I will not be able to be with you to-night. I know what the entertainment will be and that you will all enjoy it in every sense of the word. Nothing would give me more pleasure than to be with you, gentlemen—not that it would give me pleasure to say anything, because as you all know as gas men having depended entirely upon a machine to do the work for us, we are not talkers. It would give me pleasure to listen to, and absorb all that will be said here to-night; and above all is the fraternal feeling—that feeling of brotherly love what should be in every man's heart. Unfortunately it is not. Still I have neither known or seen any Association where it is more clearly shown and displayed than among the Gas Associations, for I believe, gentlemen, we are absolntely sincere in our feeling one for the other. There is no enmity here; there can be none. Every works should feel toward every other works a desire for common advancement. Our manufacturing and commercial departments work hand in hand, and it is this feeling that provides all these associations which made them so successful. The fraternal feeling I have would make me stay here, if anything in the world would do so, but unfortunately my wife is not very well—has not been for a long time, and my only child is away, I promised that I would go home to-night. I feel deeply the compliment you have paid me, but, gentlemen, my duty is there, and I never shirk duty.

On motion of Mr. Vincent a vote of thanks was extend to Mr. Warnking for his able and interesting paper.

A recess was thereupon taken to 2 P.M.

SECOND DAY—AFTERNOON SESSION.

The President asked for the

REPORT OF COMMITTEE ON INCREASING THE SCOPE OF THE ASSOCIATION, which was read by Mr. Vincent, as follows:

In following out the recommendations of the Committee on Presidential Address, your Committee begs to submit the following amendments for the consideration of the Association.

Article I. Section I. Present reading: "The name of this Association shall be the Iowa Gas Association." Amended to read: "The name of this Association shall be the Iowa District Gas Association." Article III. Section VI. Present reading: "To be eligible as an active member a person must be a President, Secretary, Treasurer, Engineer, Consulting Engineer or Superintendent of a gas company, or Manager of a gas works, or occupy such position in his company as is usually designated by one of the titles herein specified." Amended to read: "To be eligible as an active member a person must be engaged in business in the State of Iowa, Nebraska or South Dakota, and must be a President, Secretary, Treasurer, Engineer, Consulting Engineer or Superintendent of a gas company, or Manager of a gas works, or occupy such position in his company as is usually designated by one of the titles herein specified."

The above amendments have been submitted to the Council and approved by them according to Article IX., Section 59, of the Constitution.

Your Committee desires to call attention to the provision of the Constitution providing that amendments to the Constitution shall be voted on by ballot requiring a two-thirds vote. Your Committee recommends that immediate action be taken.

Respectfully submitted, G. I. VINCENT, GEO. D. ROPER, E. D. CLARY, A. L. LINDNER, } Committee.

On motion of Mr. Lindner, the Committee's report and the recommendations contained were ordered concurred in.

The President—Under our Articles this resolution amending the Constitution must be voted upon by ballot. Those in favor will vote "Yes;" those opposed "No." I will appoint as tellers Mr. Keffer and Mr. Chubb.

The ballot was thereupon taken, and the result, as announced by Mr. Keffer, was as follows: Affirmative, 24; negative, none. The amendments were thereupon declared unanimously adopted.

TIME AND PLACE OF NEXT MEETING.

The President—The Board of Control and the Executive Committee would like to hear discussion as to time and place of next meeting. There is some objection to our meeting in August, for the reason that everybody is busy and the weather is very hot. The reason they have been held heretofore at this time is to enable the people to take advantage of State Fair rates, but in most cases they are not able to do this, and in a great many instances it is unimportant because they are so close at hand. We would be glad to hear from anybody who wishes to express himself on that subject. It has been suggested that the matter be left in the hands of the Board of Control to decide the time and place of next meeting, but before doing that, if you so decide, it will be well for the members to express themselves on the matter.

Mr. Keffer—Does our constitution provide when the meeting shall be held. In that case would we not have to change it?

Mr. Lindner—Under the constitution the Council have the authority to change the time and place of meeting and to call special meetings whenever they desire. Speaking for myself, it is rather hard for me to get away at this time of the year. As a personal preference I would like to have the meeting day changed to later in the season or earlier in the spring; it is immaterial which. I presume the President desires your opinion on this matter in order that the Council may arrange the dates in accordance with your wishes.

Mr. Roper—Living out of the State of Iowa, I do not get the benefit of the State Fair rates, but I prefer August, since it saves my taking a Turkish bath, in which respect I am a little ahead. At the same time, for the benefit of those who live nearer, I move that the time and place for our next meeting be referred to the Council to decide, after the American Gas Institute shall have held its first meeting and decided whether it will hold one meeting a year or two, and at what time it will hold them, and that the Board be instructed to fix a date that will not conflict with whatever dates may be set at that time. The American Gas Institute holds its first meeting in Chicago, October 17, 18 and 19, and it would be pretty hard to say whether we would like to hold our meetings in October or in May until we knew positively the dates named by the American Gas Institute for its meeting or meetings.

Mr. Waring—As I understand it the Council has authority, but would welcome suggestions.

The President—The Council would be glad to hear expressions from every member here. It certainly is in order for any man to say what he thinks about it if he has any choice.

Mr. Averill—As Chairman of that Board, I would like to have the convention pass a resolution instead of throwing the responsibility upon the Board. Of course I am quite anxious that the next meeting should be held in Cedar Rapids—I believe in rotating. Have the next meeting at Cedar Rapids and the next at Omaha or Sioux City.

Mr. Roper—As a man that rotates and doesn't have to hire one of these Iowa fellows to do his talking for him, I would like to say Cedar Rapids has, without casting any reflections at all, one of the finest hotels in the State of Iowa, if not in the Western States. I think it would be an awful thing if you didn't accept Mr. Averill's invitation. He wants to spend the money.

Mr. Keffer—This Association is for the express benefit of the membership in its entirety. I can't help thinking that our friend's idea of rotation is a good one, and surely there is no other city in Iowa (next to Des Moines) so well fixed to entertain us as Cedar Rapids. They want us to come and it seems to me we should accept their invitation. I move, therefore, that, as to the location of the next meeting, it be the sense of this convention that our next annual meeting be held in the city of Cedar Rapids. [Seconded.]

Mr. Roper—Mr. Waring sat down on me, saying it wasn't necessary to have a motion. I don't want to sit down on somebody else, but it is already in the hands of the Council.

Mr. Keffer—The fact Mr. Waring may have made that remark does not of necessity deny us the privilege of passing a motion. The fact that the President of the Association may have agreed with Mr. Waring does not of necessity change my sentiment concerning parliamentary practice. I insist, Mr. President, that my motion is in order, not desiring that you should reverse yourself at all, but to get the opinion of the gentlemen.

The President—The Chair decides that it is in order for the convention to express its sentiments, but not to give instructions.

Mr. Vincent—One point not brought out is that it would probably be a very good idea to suggest to our Council a conference with the Council of The American Gas Institute prior to deciding on a time for this meeting. We are all aware that the sentiment of the merger which has resulted in the American Gas Institute is very much in favor

of State Associations, and I think it would be very nice to have our Council confer with theirs in this matter. [Motion adopted.]

A Vote of Thanks.

Mr. Lindner—I deem it proper at this time, in view of the elegant manner in which this Association has been treated by the Des Moines Gas Company, to offer a resolution, so I move that the thanks of this Association be tendered to the Des Moines Gas Company for the splendid manner in which they have entertained us during our session in this city; and that the especial thanks of the Association be tendered to Messrs. Vincent and Keffer, of the Des Moines Gas Company, for their earnest, zealous and persistent efforts to make our stay in their city a pleasant and profitable one. I would ask for a second to the motion. [Motion seconded.]

Mr. Clabaugh—I would also like to second that motion, but I should like to add our sympathy and regret on account of Mr. Haines's absence, he being now sick at home. I think it proper that should come in at this time.

The President—I would say that was covered by special resolution yesterday. It is all right, this simply affirms it.

Mr. Clabaugh—I wish to agree in what has been said as to the entertainment. I don't think any body of men have been better taken care of than we have in Des Moines. As far as Omaha is concerned, I feel that my co-worker here, Mr. Waring, will agree with me in thanking Mr. Keffer and Mr. Vincent and the Association for the pleasure it has given us to be with you. [Motion carried.]

(To be Continued.)

The Part Taken by the Consolidated Gas, Electric Light and Power Company in the Recent Industrial Parade.

One of the features of the great industrial pageant, held last month in Baltimore to commemorate and emphasize Greater Baltimore's Jubilee, was the display in the industrial parade made by the Consolidated Gas, Electric Light and Power Company of that city. Some idea of its magnitude and appropriateness may be gained by looking over the illustrations and text herewith given. For both of these we are indebted to the courtesy of Mr. Charles M. Cohn, Secretary of the Company.

The Consolidated Gas, Electric Light and Power Company turned out with a large display, showing a log cabin on one float, representing housekeeping before the advent of gas ranges, and a modern kitchen on a second, equipped with every modern detail.

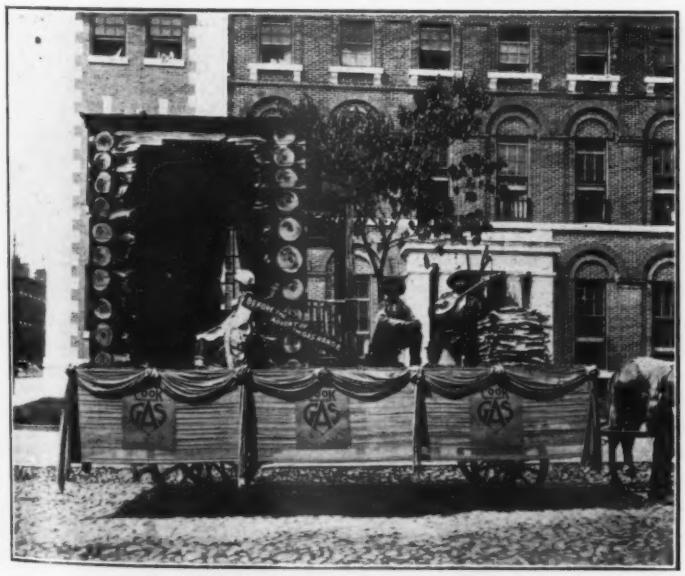
The cabin float contained two cabins, each with the wall facing the sidewalks removed. Two old "grandmothers," dressed in the style of colonial days, were busy cooking a dinner over the fireplace. The modern kitchen contained everything the heart of the most fastidious housekeeper could desire, even to a gas chandelier. The most prominent feature of the cabin float was the large open fireplace, the base of which was constructed of stone and plaster, surmounted by the old familiar shelf on which rested the candle and candlestick, and twisted paper for lighting. The chimney extended over the shelf, terminating above the roof. The fireplace was situated diagonally across the rear end of the kitchen and was fitted out with logs, brass andirons, cooking pot, tongs, bellows and numerous utensils suitable to the ancient style of kitchen. The kitchen contained a window, the panes of glass of which were small and were draped with neat curtains.

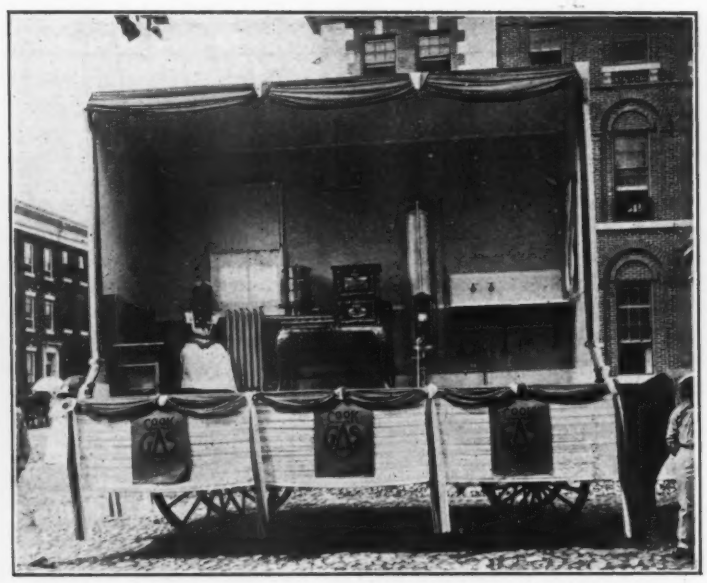
The exterior of the cabin was built of logs, with shingle roof. There was a door opening on the porch leading to a garden containing an old well, with bucket keg, typical of the old way of getting water. A garden, which was in front of the cabin, contained several trees, sunflowers, rose bushes, picket fence and woodpile, where an old darky was busy chopping wood. Near at hand was a young negro playing a banjo. The base of the float was decorated in light and dark green.

The modern kitchen contained a gas range, gas water heater, deepring waffle iron, cake griddle, sad-iron heater and Lawrence patent baffle plate; also enamel sink, boiler, table, chair and draped window. The walls and ceiling were covered with white paper, with an artistic wainscoting representing tiles. The floor was covered with a neat pattern of linoleum. A young woman, wearing modern dress, demonstrated the convenience of cooking with gas.

The base of this float was draped in yellow and white. Each float was drawn by four black horses, suitably decorated, and each was attended by an employee of the Company.

Another float contained an exceedingly realistic miniature reproduction of the Company's Westport power house, which attracted much attention and many favorable comments. Clouds of black smoke poured from the smokestack, greatly heightening the effect. The model was 16 by 8 feet and 5½ feet high. The smokestack rose to a point of 14 feet above the ground. The model was drawn by 6 of the Company's fine horses, each led by one of the engineers of the plant.

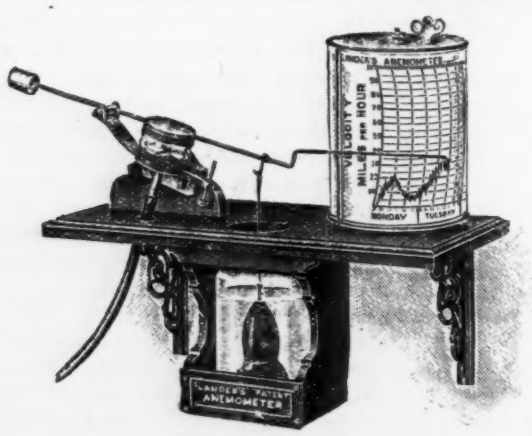




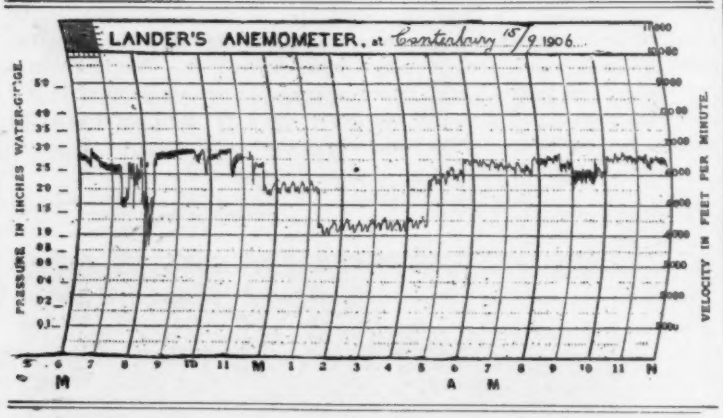
The Lander Anemometer and Gas Pressure Recorder.

The *Journal of Gas Lighting* notes that the above named instrument, which was primarily designed to indicate and record with great accuracy the velocity of air currents, chimney and furnace drafts, etc., has now been made by Mr. Lander, of Canterbury, the inventor (in conjunction with Mr. H. C. Page, who is Engineer of the Canterbury Gas and Water Company), applicable to the registration of coal or water gas pressures, at the same time recording the actual velocity, "in feet per miuute," at which the gas would pass through the pipes at the pressure indicated.

In the recorder, the pressure is conducted through a small flexible tube to the interior of a thin bellows so delicately counterpoised that



movement takes place with the slightest variation in pressure. Attached to the disk or plate of the bellows is a lever carrying a capillary pen, which records on a drum rotated by means of an 8-day clock. The lever is weighted with a small cone floating in a vessel of glycerine, the density of which is so adjusted as to allow the conical float to almost sink. When the float thus lies in the glycerine, it has no weight; but when the bellows are distended by the pressure of the gas, the float rises, and thus the weight gradually increases until the float is completely lifted above the surface of the liquid. The shape and weight of this cone, therefore, determine the exact scale of the recording diagram.



The recorder is perfectly simple in action. It has a minimum of moving parts; and there is absolutely nothing to get out of order. The whole of the mechanism is contained in a small dust proof case, with glass front, admitting of easy observation. The diagrams are printed to indicate pressure in inches of water gauge, and also velocity in feet per minute. Some idea of its accuracy may be gained by noting that 1 inch on the diagram is equal to ¼ inch of water gauge, thus enabling small readings to be taken with great precision.

ITEMS OF INTEREST FROM VARIOUS LOCALITIES.

To our illustrated mention in the JOURNAL for the 8th inst, respecting the Eureka Water Meter, should have been added that the device is being manufactured by the Pittsburgh Meter Company, of East Pittsburgh, Pa.

MR. CHARLES M. LYONS, of Philadelphia, Pa., has accepted a responsible position with the United Gas Improvement Company at its Kansas City-Missouri plant.

THE City Council of Providence, R. I., has retained Mr. A. B. Adams as its specialist to urge good and valid reasons why the gas rate should be reduced there.

THE celebrated Prof. G. W. Bemis, of Cleveland, O., has been retained to testify for the city of Buffalo in respect of the latter's appeal to the New York State Commission of Gas and Electricity for a hearing on the revision of the rates charged for gas in Buffalo. Prof. Bemis is having quite a lot of opportunities just now in his particular line of testimony.

THE Jeffrey Manufacturing Company, Columbus, O., have established a new Canadian branch office in Montreal, Canada, at Lagauchetiere and Cotè streets.

THE output of gas by the Boston Company for the first 10 days of October as compared with the corresponding days of 1905, shows a percentage gain of 11.

A CORRESPONDENT in Stamford, Conn., forwards the following under date of the 10th inst.: "It is 11 years since a franchise was given to the Connecticut Railway and Lighting Company for supplying Greenwich with gas, and still the village has not this much needed commodity, without which its growth is badly retarded. Now that another session of the Legislature is soon to come, it is well to look up the matter once again, and see if something cannot be accomplished toward getting gas supplied there. Representatives are to be elected and men should be selected for these positions who will make a fight with the end in view that Greenwich shall have what it wants and needs—gas. Then communities might be appointed to wait upon the committee of the Legislature to further this demand and either induce the Company with the franchise to go ahead or leave the field open to others. That other companies would soon put in gas if given the right is assured; it is also probable that were the franchise out of the hands of the Connecticut Railway and Lighting Company, a company would be formed here to furnish the town with cheaper lighting by gas. This latter is greatly to be desired, for while the Lighting Company holds a monopoly of the lighting, the cost is much greater than is warranted. Should a local company be formed, it would be assured that lights would cost much less than now and the public would be greatly benefited. With another than the Connecticut Railway and Lighting Company in the field, competition would set in with much the same result."

MR. T. F. WOLF has resigned his position as Superintendent of the Penn Gas Coal Company. His successor is Mr. A. P. Cameron.

THE following notice was issued from the office of the Hartford (Conn.) City Gas Light Company under date of the 15th inst.: "The attention of gas consumers is called to the following schedule of reduced prices for gas which will become effective at once, and will apply to bills rendered November 1st, 1906, and will be based on monthly use per meter:

Quantities.				Billed at.	Net Price.
500 cubic feet or less, minimum charge				$0.55	$0.50
600	"	to 10,000 cubic feet		1.05	.95
10,000	"	to 50,000	"	1.00	.90
50,000	"	to 100,000	"	.95	.85
100,000	"	to 250,000	"	.90	.80

Special consideration to larger users. The cash discount making the net price is 10 cents per 1,000 cubic feet on all bills paid before the 15th of the month following that in which the gas is used, provided all previous indebtedness is paid."

MR. LOUIS D. KELSEY, Manager of the Brookfield (Mo.) Gas, Electric and Heating Company, informs us that the Western Gas Construction Company is fulfilling its contract under which the latter is erecting another 25,000 cubic feet capacity gasholder. The Brookfield Company is certainly a good, healthy 5-year old, and not a little of its sturdiness is traceable to the careful bringing-up of Messrs. Keefer, Peasley and Kelsey.

THE Standard Gas and Electric Company, of Raleigh, N. C., has sold its electric lighting plant and the business thereof to the Raleigh Electric Company. The purchasers have been operating the local electric railway system for some years.

MR. WALTON FORSTALL, Secretary of the Philadelphia Section of the Illuminating Engineering Society, informs us that at the organization meeting of the Society, which was held last month in the rooms of the Engineers' Club, 1122 Girard street, Philadelphia, 63 were present out of an enrolled total of 103, and 15 additional applications were in hand. The following officers were elected: President, Horatio A. Foster; Vice-President, Isaac H. Francis, Jr.; Secretary, Walton Forstall; Treasurer, H. Calvert; Directors, H. J. Buddy, Benjamin L. Cates, R. J. Rolston, John B. Klumpp and James T. Maxwell. The Section will probably meet on the third Friday of every month, but no meetings will be called for June, July and August. For the present at least the meetings will be held in the rooms of the Engineers' Club, and the first regular meeting was set for 8 P.M. of the 19th inst. The programme for the

meeting was the discussion of the two papers, read respectively at the October meeting of the New York Section, by Messrs. J. E. Woodwell and E. C. White. As the Secretary suggests, everyone located in or near Philadelphia that is interested in the sale of appliances for the utilization of light in any way, will find it of great advantage to become members of the Philadelphia Section.

THE City Council of Alexandria, Va., has established a new net selling rate of $1.10 per 1,000 cubic feet.

THE Baltimore Retort and Firebrick Company has been awarded a contract for the construction of 2 half-depth benches of 6's on the new plant at Hyattsville, Md.

THE Appellate Division of the Supreme Court, New York, has decided that the city of New York cannot inspect the books of the Brooklyn Union Gas Company in an effort to determine whether the Company overcharged the city for gas supplied in the old Brooklyn district on public account during the period between January 7, 1903 and March 16, 1904. After the old contract with the city expired on January 7, 1903, the city rejected the bids of the gas Company as too high. Until a new contract was signed bills were presented to the city for the gas used at a rate of 90 cents per 1,000 cubic feet, an aggregate of $135,133.14. Bills for labor and material, amounting to an additional $126,988, were also presented. These bills the city decided were exorbitant and Corporation Counsel Delany gave it as his opinion that the Company was compelled to furnish light to the city and depend for collection on what should be determined by the courts to be a reasonable price. The opinion of the Appellate Division, written by Justice Gaynor, points out that as the price was fixed by the Legislature at $1.25 per 1,000 feet, the courts have no power to lower it. Justice Gaynor says the courts cannot be permitted to set aside acts of the Legislature which do not violate the constitution.

AT the first fall meeting of the Engineers' Club, of Cleveland, O., held the 7th inst., a very interesting paper on "Gas Producer and Producer Gas, with Special Reference to Power Applications, as Illustrated by the Large Central Producer Gas Power Plant now in Construction at Greendale, Hocking county, O," by Mr. S. S. Wyer, engineer in charge. The lecture was illustrated plentifully and well by means of slides, and the text of the speech was put together in the shape that should be looked for from a member of the famous 1901 Class, Ohio State University.

MR. E. G. COWDERY, speaking as President of the Beloit (Wis.) Water, Gas and Electric Company, declares that a sum pretty close to $100,000 will be expended next year in putting the gas section of that concern in good order. The scheme includes the putting in of at least 12 miles of mains within the next 3 years.

MR. HENRY NICKERSON, of Quincy, Ills., has been appointed a member of the photometrical and analytical staff of the Peoples Gas Light and Coke Company, of Chicago.

HARVESTING by artificial light is counted a success in England, the lighting agent being afforded through portable acetylene gas machines.

MR. B. O. Tippy, Vice-President and General Manager of the Grand Rapids (Mich.) Gas Light Company, is to be congratulated on the cleverness of his lecture on the "History, Manufacture and Uses of Coal Gas," delivered by him a fortnight ago before a large audience, made up, mainly of the Company's employees. The lecture room was the handsome offices of the Company, and a number of lantern slides were used to illustrate the "talk." Manager Tippy is an exceedingly clever lecturer.

THE Supreme Court, of Wisconsin, has ruled that city authorities may not successfully appeal for an inspection of the books and accounts of gas companies, in cases where attempts are being made to order lower selling rates for gas. The Court declares that the remedy for revising of gas prices lies with the legislature only.

THE City Council of Little Falls, N. Y., has adopted a resolution asking the Herkimer County Light and Power Company to reduce its net selling rate to $1 per 1,000 cubic feet, the gentlemen up-the-State said that New York city should have cheaper gas and the necessary legislation was so easily obtained that the up-the-State gentlemen (the legislators, of course are so referred to) now seemingly believe that that which was sauce for the city goose is good enough sauce for the country gander.

AT the annual meeting of the Granville (N. Y.) Electric Light and Gas Company the officers elected were: Directors, M. O. Kasson, F. T. Pember, F. D. Howland, H. R. Kasson, W. J. Gallagher, N. T. Drake and B. G. Higley; President, M. O. Kasson: Vice-President, F. D. Howland; Treasurer, W. J. Gallagher; Secretary, B. G. Higley.

A CORRESPONDENT in New Orleans La., writing under date of the 12th inst., says: "This interesting bit of comment respecting the stresses of winds on gasholder structures is from the *Times-Democrat* of the 6th inst.—of course the matter is relevant to the late fierce storm that swept the Gulf country: "That the powerful new gasholder of the New Orleans Lighing Company was responsible in a large measure for the dissolving or the breaking of the tornado near where it is located, was the belief in many quarters last night, and it was argued in a number of places that the big structure proved the master of the small tornado and effectively squelched it at that point. This holder was struck by the tornado, but no damage was done, demonstrating that it was proof against the strength generated by that atmospheric disturbance. The holder is more than 150 feet high, and its strength was effectively tested in the last storm which passed over New Orleans. That it was struck fairly by the tornado of yesterday all who were in the vicinity are confident, and consequently the general belief is that when the tornado struck the gas tower it found its master and was broken up by the blow, later dissolving and disappearing in the air. Mr. Thomas D. Miller, Manager for the New Orleans Lighting Company, tells one or two interesting stories connected with the visit of the tornado to the gas works. The carpenter for the Company was standing near a closed window watching the storm as it moved along, spreading destruction in its wake. Suddenly a gust of wind threw the sash before which he was standing around his neck, his head butting out one of the panes of glass."

WE understand that Mr. C. H. H. Stone has been provisionally appointed as gas expert for the New York State Commission of Gas and Electricity, pending the civil service examination for the vacancy occasioned by the resignation of Mr. Darbee.

MR. C. H. QUACKENBUSH, of Philadelphia, is now in active charge of the American Gas Company's properties at East St. Louis, Mo.

PERHAPS the following item in respect of the ruling in the Brooklyn contract-rate gas case, giving the text of the decision, will be of interest: "The price charged was less than the maximnm of $1.25 per 1,000 cubic feet, fixed by Section 70 of the Transportation Corporation law, as the price which gas companies may charge cities of the class of the defendant, The defendant's answer raised the question that the price charged is excessive and its claim is that the trial court must ascertain the reasonable price and give judgment for that only. The inspection was asked for in order to ascertain the cost of production of gas to the plaintiff, as bearing on the question of reasonable price to the consumer. The rule is, that public service corporations may charge only a reasonable rate and the courts may ascertain such rates in a given case. But this rule has no application where the Legislature has fixed the rate. The people, through their representatives assembled in Legislature, have the undoubted power to fix the rate which public service corporations shall charge the public. That is a legislative matter. If the Legislature fix the fare too high, the people may elect legislative representatives who will lower it. The courts have no power to lower it. It is not for the courts to upset what the people do by their legislative representatives, except in the case of a legislative act which is contrary to some provision of the Constitution, of which there can be no pretense here. The claim that the rate fixed by the Legislature is excessive is a thing to be addressed to the next Legislature, not to the courts. The people speak through the Legislature, everyone being represented therein, and thereby voluntarily bind themselves and all the subdivisions of their government. The case is not one calling for an extended discussion. It rests upon the fundamental principle of representative government. The costs of the production of gas to the plaintiff is, therefore, an immaterial fact in this case. The plaintiff had the right to charge not to exceed the maximum price fixed by the statutes. The order should be affirmed."

THE AMERICAN GAS LIGHT JOURNAL

A. M. CALLENDER & CO.,
PROPRIETORS.

THOS. J. CUNNINGHAM,
ELBERT P. CALLENDER,
EDITORS.

CHAS. E. SANDERSON,
MANAGER.

PUBLISHED ON EACH MONDAY OF THE YEAR AT
No. 42 Pine Street, New York.
Telephone, 2996 John.

TERMS:

SUBSCRIPTION—Three Dollars per annum, in advance.
Single copies, 10 cents.

The JOURNAL is the official organ of the
NEW ENGLAND ASSOCIATION OF GAS ENGINEERS.
AMERICAN GAS LIGHT ASSOCIATION.
WESTERN GAS ASSOCIATION.
OHIO GAS LIGHT ASSOCIATION.

NOTIFICATION RESPECTING ADVERTISING.

Orders for new advertising, or for changes in standing advertisements, to insure attention in the issue following their reception, must be in hand any time of Wednesday.

AGENTS

New York—American News Co., 39 and 41 Chambers St.
Germany—Lemcke & Buechner, of New York.
England—Aug. Siegle, 30 Lime Street, London.

MONDAY, OCTOBER 22, 1906.

The Market for Gas Securities.

The advance of the minimum rate of discount of the Bank of England is rather surprising and unusual, particularly at this time of the year.

Stock opened from 1 per cent. to 3 per cent. down from last night's closing. Gas securities sold down in sympathy with the rest of the market. Consolidated Gas closed at 140-142, and opened at 139.

The Chattanooga Gas Light Company has sold its ptant to a new Company composed of Robert Pritchard, J. P. Hoskins, George McGee, H. A. Thornton and J. B. Sizer. The new Company has applied for a charter with $1,250,000 capital. Improvements costing $75,000 will be commenced.

Gas Stocks.

Quotations by George W. Close, Broker and Dealer in Gas Stocks.

16 WALL STREET, NEW YORK CITY.

OCTOBER 22.

☞ All communications will receive particular attention.

☞ The following quotations are based on the par value of $100 per share.

N. Y. City Companies.	*Capital.*	*Par.*	*Bid.*	*Asked.*
Consolidated	$73,177,000	100	139	139½
Central Union Gas Co.—				
1st 5 s, due 1972, J. & J.	3,000,000	1,000	101	104
Equitable Gas Light Co.—				
Con. 5's, due 1932, M. & S.	1,000,000	1,000	..	105
Mutual	3,500,000	100	190	225
New Amsterdam Gas Co.—				
1st Con. 5's, due 1948, J. & J.	11,000,000	1,000	99	101
New York & Richmond Gas				
Co. (Staten Island)	1,500,000	100	37	43
1st Mtg. Gold Bds. 5 p.ct.	1,000,000	..	98	104
Northern Union—				
1st 5's, due 1927, J. & J.	1,250,000	1,000	101	103
New York and East River—				
1st 5's, due 1944, J. & J.	3,500,000	1,000	108	111
Con 5's, due 1945, J. & J.	1,500,000	..	104	110
Standard	5,000,000	100	140	160
Preferred	5,000,000	100	155	175
1st Mtg 5 s, due 1930, M. & N	1,500,000	1,000	104	108
The Brooklyn Union	15,000,000	1,000	105	120
1st Con. 5 s, due 1948, M. & N	15,000,000		107	..
Yonkers	299,650	500	130	..
Out-of-Town Companies.				
Bay State	50,000,000	50	5/16	⅝
" Income Bonds	2,000,000	1,000	..	75
Binghamton Gas Works	450,000	100	..	65
" 1st Mtg. 5's	509,000	1,000	95	100
Boston United Gas Co.—				
1st Series S. F. Trust	7,000,000	1,000	82	85
2d " " "	3,000,000	1,000	47½	50
Buffalo City Gas Co.	5,500,000	100	9	10
" " Bonds, 5's	5,250,000	1,000	75	80
Capital, Sacramento	500,000	50	..	35
Bonds (6's)	150,000	1,000	..	..
Chicago Gas Co. Guaranteed Gold Bonds	7,650,000	1,000	104	106¾
Cincinnati Gas and Electric Co.	29,500,000	100	100½	101
Columbus (O.) Gas Co., 1st Mortgage Bonds	1,500,000	1,000	90	..
Columbus (O.) Gas Lt. & Heating Co	1,682,750	100	..	95
Preferred	3,026,500	100	107½	108
Consumers, Toronto	2,300,000	50	200	204
Consolidated, Baltimore	11,000,000	100	82	90
Mortgage, 6's	3,600,000	..	..	118
Chesapeake, 1st 6's	1,000,000	..	..	..
Equitable, 1st 6's	910,000	..	..	..
Consolidated, 1st 5's	1,490 000	..	..	112
Consolidated Gas Co. of N. J.	1,000,000	100	15	17
Con. Mtg. 5's	880,000	1,000	92	95
Bonds	75,000	..	..	100
Detroit City Gas Co	5,000,000	50	..	50
" Prior Lien 5's	4,618,000	1,000	..	98
Detroit Gas Co., 5's	381,000	1,000	75	80
" Inc. 5's	16,000	100	98½	100
Equitable Gas & Fuel Co., Chicago, Bonds	2,000,000	1,000	..	101
Essex and Hudson Gas Co.	6,500,000	..	39	40
Fort Wayne	2,000,000	..	..	..
" Bonds	2,000,000	..	55	..
Grand Rapids Gas Lt. Co. 1st Mtg. 5's	1,225,000	1,000	104½	105
Hartford	750,000	95	190	200
Hudson County Gas Co., of New Jersey	10,500,000	..	110	112
" Bonds, 5's	10,500,000	..	107½	108½
Indianapolis	2,000,000	..	60	70
" Bonds, 5's	2,650,000	..	104½	105
Jackson Gas Co	250,000	50	82	..
" 1st Mtg. 5's	290,000	1,000	97	100
Kansas City Gas Light Co., of Missouri	5,000,000	100	..	36
Bonds, 1st 5's	3,822,000	1,000	102	104
Laclede, St. Louis	10,000,000	100	.	105
Preferred	2,500,000	100	95	110
Bonds	10,000,000	1,000	104	104½
Lafayette Gas Co., Ind.	1,000,000	100	..	60
Bonds	1,000,000	1,000	60	65
Louisville	2,570,000	50	143	145
Madison Gas & Elec. Co.				
" 1st Mtg. 6's	350,000	1,000	106	108¾
" 6 per cent. scrip, due 1910	100,000	25	85	87
Massachusetts Gas Companies of Boston	25,000,000	100	60	60½
Preferred	25,000,000	100	88	88⅛
Montreal, Canada	2,000,000	100	218	218½
Nashville Gas Lt. Co.	1,000,000	100	110	..
Newark, N. J., Con. Gas Co.	6,000,000	..	56	58
Bonds, 6's	6,000,000	..	137	138
New Haven	2,000,000	25	200	..
Peoples G. L. & Coke Co., of Chicago	25,000,000	100	90	90⅛
Peoples Gas Lt. & Coke Co., Chicago, 1st Mortgage	20,100,000	1,000	..	..
2d "	2,500,000	1,000	104	..
Rochester Gas & Elec. Co.	2,150,000	50	88	..
Preferred	2,150,000	50	118	..
Consolidated 5's	2,000,000	..	104¼	105¼
San Francisco, Cal.	15,800,000	100	..	..
St. Joseph Gas Co. 1st Mtg. 5's	751,000	1,000	92	..
St. Paul Gas Light Co	1,500,000	100	45	47
1st Mortgage 6's	650,000	1,000	113	116
Extension, 6's	600,000	1,000	112½	115
General Mortgage, 5's	2,465,000	1,000	96¼	..
Syracuse N. Y.	1,975,000	100	50	55
Bonds	2,047 000	1,000	102	..
Washington, D. C	2,600,000	20	290	292½
First mortgage 6's	600,000	..	..	..
Western, Milwaukee	4,000,000	..	..	..
Wilmington, Del.	600,000	50	230	..

Advertisers' Index.

GAS ENGINEERS. Page

A. E. Boardman, New York City ... 726
Baxter & Young, Detroit, Mich ... 743
B. E. Chollar, St. Louis, Mo ... 736
Cruse-Kemper Co., Philadelphia, Pa ... 732
Davis & Farnum Mfg. Co., Waltham, Mass ... 741
Economical Gas Apparatus Construc'n Co., Toronto, Ont ... 726
Frank D. Moses, Trenton, N. J ... 744
Fred. Bredel Co., Milwaukee, Wis ... 742
Frederic Egner, Norfolk, Va ... 748
H. M. Byllesby & Co., Chicago, Ills ... 731
Humphreys & Glasgow, New York City ... 745
Isbell-Porter Co., Newark, N. J ... 732
J. F. W. Jost, Philadelphia, Pa ... 733
Kerr Murray Mfg. Co., Fort Wayne, Ind ... 744
The Gas Machinery Co., Cleveland, O ... 728
The Jeffrey Manufacturing Co., Columbus, O ... 742
United Gas Improvement Co., Philadelphia, Pa ... 739
Western Gas Construction Co., Fort Wayne, Ind ... 708

GAS WORKS APPARATUS AND CONSTRUCTION.

A. E. Boardman, New York City ... 726
Bartlett, Hayward & Co., Baltimore, Md ... 745
Baxter & Young, Detroit, Mich ... 743
Connelly Iron Sponge & Governor Co., New York City ... 741
Continental Iron Works, Brooklyn, N. Y ... 746
Cruse-Kemper Co., Philadelphia, Pa ... 732
Davis and Farnum Mfg. Co., Waltham, Mass ... 744
Delly & Fowler, Philadelphia, Pa ... 748
Economical Gas Apparatus Construc'n Co., Toronto, Ont ... 726
Frank D. Moses, Trenton, N. J ... 744
Fred. Bredel Co., Milwaukee, Wis ... 742
Humphreys & Glasgow, New York City ... 745
Isbell-Porter Company, New York City ... 732
Kerr Murray Mfg. Co., Fort Wayne, Ind ... 744
Lloyd Construction Co., Detroit, Mich ... 734
Logan Iron Works, Brooklyn, N. Y ... 738
Quintard Iron Works, New York City ... 745
R. D. Wood & Co., Philadelphia, Pa ... 746
Riter-Conley Mfg. Co., Pittsburgh, Pa ... 747
Stacey Mfg. Co., Cincinnati, O ... 747
The Gas Machinery Co., Cleveland, O ... 728
United Gas Improvement Co., Philadelphia, Pa ... 739
Western Gas Construction Co., Fort Wayne, Ind ... 708

PROCESSES.

Bartlett, Hayward & Co., Baltimore, Md ... 745
B. E. Chollar, St. Louis, Mo ... 736
California Light and Fuel Co., San Francisco, Cal ... 746
Economical Gas Apparatus Construc'n Co, Toronto, Ont ... 726
Fred. Bredel Co., Milwaukee, Wis ... 742
Humphreys & Glasgow, New York City ... 745
The Gas Machinery Co., Cleveland, O ... 728
United Gas Improvement Co., Philadelphia, Pa ... 739
Western Gas Construction Co., Fort Wayne, Ind ... 708

SCRUBBERS AND CONDENSERS.

Continental Iron Works, Brooklyn, N. Y ... 746
Cruse-Kemper Co., Philadelphia, Pa ... 732
Davis & Farnum Mfg. Co., Waltham, Mass ... 744
Economical Gas Apparatus Construc'n Co., Toronto, Ont ... 726
Fred. Bredel Co., Milwaukee, Wis ... 742
Isbell-Porter Co., Newark, N. J ... 732
Kerr Murray Mfg. Co., Fort Wayne, Ind ... 744
Logan Iron Works, Brooklyn, N. Y ... 738
R. D. Wood & Co., Philadelphia, Pa ... 746
Riter-Conley Mfg. Co., Pittsburgh, Pa ... 747
Stacey Mfg. Co., Cincinnati, O ... 747
The Gas Machinery Co., Cleveland, O ... 728
Western Gas Construction Co., Fort Wayne, Ind ... 708

PRODUCER POWER PLANTS.

Economical Gas Apparatus Construc'n Co., Toronto, Ont ... 726
R. D. Wood & Co., Philadelphia, Pa ... 746

TAR AND CARBONIC ACID EXTRACTION.

Economical Gas Apparatus Construc'n Co., Toronto, Ont ... 726
Fred. Bredel Co., Milwaukee, Wis ... 742
Isbell-Porter Co., Newark, N. J ... 732
Kerr Murray Mfg. Co., Fort Wayne, Ind ... 744
Stacey Mfg. Co., Cincinnati, O ... 747
The Gas Machinery Co., Cleveland, O ... 728
Western Gas Construction Co, Fort Wayne, Ind ... 708

AMMONIA CONCENTRATORS.

Fred. Bredel Co., Milwaukee, Wis ... 742
Kerr Murray Mfg. Co., Fort Wayne, Ind ... 744
Michigan Ammonia Works, Detroit, Mich ... 726
The Gas Machinery Co., Cleveland, O ... 728
Western Gas Construction Co., Fort Wayne, Ind ... 708

GAS METERS.

American Meter Co., New York and Philadelphia. 751
Detroit Meter Company, Detroit, Mich..... 707
D. McDonald & Co., Albany, N. Y..... 749
Helme & McIlhenny, Philadelphia, Pa..... 751
John J. Griffin & Co., Philadelphia, Pa. 752
Keystone Meter Co., Royersford, Pa..... 750
Maryland Meter and Mfg. Co., Baltimore, Md 750
Metric Metal Co., Erie, Pa..... 749
Nathaniel Tufts Meter Co., Boston, Mass..... 748
New York Improved Meter Co., New York City 750
Pittsburg Meter Co., East Pittsburg, Pa. 749
Rotary Meter Co., New York City 727

PREPAYMENT METERS.

American Meter Co., New York and Philadelphia..... 751
D. McDonald & Co., Albany, N. Y..... 749
Helme & McIlhenny, Philadelphia, Pa..... 751
John J. Griffin & Co., Philadelphia, Pa. 752
Keystone Meter Co., Royersford, Pa..... 750
Nathaniel Tufts Meter Co., Boston, Mass..... 750
New York Improved Meter Co., New York City..... 750
Pittsburg Meter Co., East Pittsburg, Pa. 749

PREPAYMENT METER ATTACHMENTS.

New York Improved Meter Co., New York City 750
Reeves Mfg. Co., New Haven, Conn. 747

WATER METERS.

Pittsburg Meter Co., East Pittsburg, Pa..... 749

GAS AND WATER PIPES.

Davis & Farnum Mfg. Co., Waltham, Mass..... 744
Donaldson Iron Co., Emaus, Pa..... 736
Economical Gas Apparatus Construc'n Co., Toronto, Ont. 726
R. D. Wood & Co., Philadelphia, Pa..... 746
Warren Foundry and Machine Co., New York City..... 736

GAS COALS.

Berwind White Coal Mining Co., New York and Phila. 742
Perkins Co., New York City..... 742
Westmoreland Gas Coal Co., Philadelphia, Pa 743

SPECIALTIES FOR OIL AND PIPE LINES.

S. R. Dresser, Bradford, Pa..... 730

GAS MAIN STOPPERS.

Safety Gas Main Stopper Co., New York City..... 736

MAIN AND SERVICE LAYING.

Sullivan Bros., Flushing, N. Y..... 686

GAS TAPPING MACHINES.

George Light, Dayton, O..... 736
H. Mueller Manufacturing Co., Decatur, Ills..... 729

CANNEL COALS.

Perkins & Co., New York City..... 742

STOKING MACHINERY.

G. A. Bronder, New York City..... 743

CONVEYORS.

Cruse-Kemper Co., Philadelphia, Pa 732
C. W. Hunt Company, New York City..... 733
Dodge Coal Storage Co., New York City..... 735
Economical Gas Apparatus Construc'n Co., Toronto, Ont 726
Fred. Bredel Co., Milwaukee, Wis..... 742
G. A. Bronder, New York City..... 741
Kerr Murray Mfg. Co., Fort Wayne, Ind..... 744
Link-Belt Co., Philadelphia and Chicago..... 733
The Gas Machinery Co., Cleveland, O..... 728
The Jeffrey Manufacturing Co., Columbus, O..... 742
Western Gas Construction Co., Fort Wayne, Ind..... 708

CHARGING BARROWS & COAL WAGONS.

Davis & Farnum Mfg. Co., Waltham, Mass..... 744
Kerr Murray Mfg. Co., Fort Wayne, Ind..... 744
Stacey Mfg. Co., Cincinnati, O..... 737

GAS ENRICHERS.

Standard Oil Co., New York City,..... 699
Sun Company, Pittsburgh, Pa..... 743
The Sun Oil Co., Pittsburgh, Pa 743

COKE CRUSHERS.

C. M. Keller, Columbus, Ind. 743
Fred. Bredel Co., Milwaukee, Wis. 743
The Jeffrey Manufacturing Co., Columbus, O..... 742

GAS METER CONNECTIONS.

H. Mueller Manufacturing Co., Decatur, Ills 729

GAS COCKS.

H. Mueller Manufacturing Co., Decatur, Ills..... 729

GAS GAUGES.

The Bristol Co., Waterbury Conn 728

GAS GOVERNORS.

Chaplin-Fulton Mfg. Co. Pittsburgh, Pa..... 725
Connelly Iron Sponge & Governor Co., New York City. 741
Fred. Bredel Co., Milwaukee, Wis. 742
Isbell-Porter Co., Newark, N. J..... 732
Johnson-Reynolds Co., Anderson, Ind..... 743
Pittsburg Meter Co., East Pittsburg, Pa..... 749
R. D. Wood & Co., Philadelphia, Pa..... 746

CEMENTS.

C. L. Gerould, Pittsburgh, Pa..... 740

(*Continued on page 726.*)

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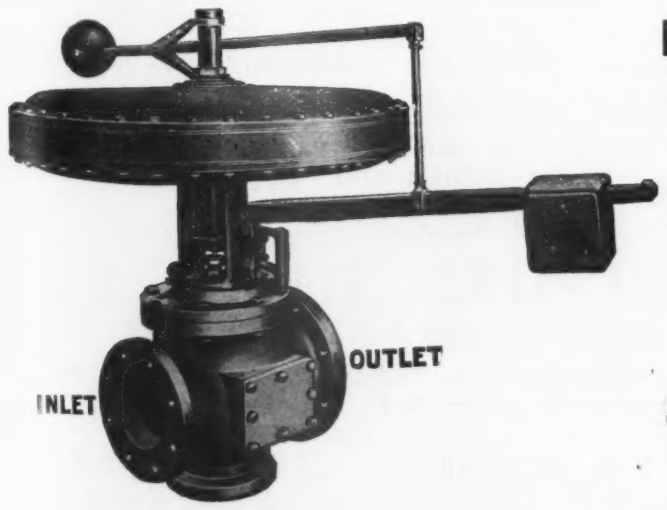

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28-34 PENN AVE., PITTSBURGH, PA.

(Concluded from page 735.)

RETORTS AND FIREBRICKS.

Baltimore Retort and Firebrick Co., Baltimore, Md... 740
Gas Bench Construction Co., St. Louis, Mo. 740
Henry Maurer & Son, New York City..... 740
James Gardner, Jr., Co., Pittsburgh, Pa..... 740
J. H. Gautier & Co., Jersey City, N. J..... 740
Laclede Firebrick Mfg. Co., St. Louis, Mo..... 738
Missouri Firebrick Co., St. Louis, Mo 740
National Pyrogranit Co., New York City..... 740
Parker-Russell Mining and Mfg. Co., St. Louis Mo.... 741

INCLINED RETORTS.

Baltimore Retort and Firebrick Co., Baltimore, Md 740
Fred. Bredel Co., Milwaukee, Wis..... 742
Gas Bench Construction Co., St. Louis, Mo..... 740
Parker-Russell Mining and Mfg. Co., St. Louis, Mo..... 741

VERTICAL S'S.

Connelly Iron Sponge & Gov. Co. (Drake's [Eng.] System) 741
Fred. Bredel Co., Milwaukee, Wis..... 742
Gas Bench Construction Co., St. Louis, Mo..... 740
Parker-Russell Mining and Mfg. Co., St. Louis, Mo..... 741

REGENERATIVE FURNACES.

Baltimore Retort and Firebrick Co., Baltimore, Md..... 740
Bartlett, Hayward & Co., Baltimore, Md..... 745
Fred. Bredel Co., Milwaukee, Wis,..... 742
Gas Bench Construction Co., St. Louis, Mo..... 740
J. H Gautier & Co., Jersey City, N. J..... 740
Laclede Firebrick Mfg. Co., St. Louis, Mo..... 738
Missouri Firebrick Co., St. Louis, Mo..... 740
Parker-Russell Mining and Mfg. Co., St Louis, Mo. ... 741

SELF-SEALING MOUTHPIECE DOORS.

Continental Iron Works, Brooklyn, N Y..... 746
Davis & Farnum Mfg Co., Waltham, Mass..... 744
Fred. Bredel Co., Milwaukee, Wis..... 742
Isbell-Porter Co., Newark, N. J..... 732
Kerr Murray Mfg. Co., Fort Wayne, Ind..... 744
Logan Iron Works, Brooklyn, N. Y..... 738
R. D. Wood & Co., Philadelphia, Pa..... 746
Stacey Mfg. Co., Cincinnati, O 737
The Gas Machinery Co., Cleveland, O..... 738
Western Gas Construction Co., Fort Wayne, Ind..... 708

INCANDESCENT GAS LAMPS.

D. M. Steward Mfg. Co., Chattanooga, Tenn..... 730
General Gas Light Co., Kalamazoo, Mich..... 735
Geo. G. Ramsdell, New York City..... 726
Welsbach Company, Gloucester, N. J..... 738

BURNERS.

D. M. Steward Mfg. Co., Chattanooga, Tenn.. 730
Wm. M. Crane Co., New York City.. 730

LAVA GAS TIPS.

D. M. Steward Mfg. Co., Chattanooga, Tenn 730

STREET LAMPS.

Thos. T. W. Miner, New York City..... 736
Welsbach Street Lighting Co., New York and Phila... 738

PURIFIERS.

Connelly Iron Sponge & Governor Co., New York City.. 741
Cruse-Kemper Co., Philadelphia, Pa..... 732
Davis & Farnum Mfg. Co., Waltham, Mass..... 744
Fred. Bredel Co., Milwaukee, Wis. 742
Isbell-Porter Co., Newark, N. J..... 732
Kerr Murray Mfg. Co., Fort Wayne, Ind..... 744
R. D. Wood & Co., Philadelphia, Pa..... 746
Stacey Mfg. Co., Cincinnati, O.. 747
Western Gas Construction Co., Fort Wayne, Ind..... 708

PURIFYING MATERIALS.

Connelly Iron Sponge & Governor Co., New York City.. 741
Greenpoint Chemical Works, Brooklyn, N. Y..... 726

VALVES.

Continental Iron Works, Brooklyn, N. Y.. 746
Davis & Farnum Mfg. Co., Waltham, Mass.. 741
Economical Gas Apparatus Construc'n Co, Toronto, Ont 726
Isbell Porter Co., Newark, N. J..... 732
Kerr Murray Mfg. Co., Fort Wayne, Ind..... 744
Ludlow Valve Manufacturing Co., Troy, N. Y..... 733
R. D. Wood & Co., Philadelphia, Pa..... 746
Stacey Mfg. Co., Cincinnati, O..... 747
The P. H. & F. M. Roots Co.. Connersville, Ind..... 735
Western Gas Construction Co., Fort Wayne, Ind..... 708

EXHAUSTERS.

Connelly Iron Sponge & Governor Co., New York City.. 741
Connersville Blower Co., Connersville, Ind..... 734
Davis & Farnum Mfg. Co., Waltham, Mass..... 744
Isbell-Porter Company, Newark, N. J..... 732
Kerr Murray Mfg. Co., Fort Wayne, Ind..... 744
The P. H. & F. M. Roots Co., Connersville, Ind..... 735

PURIFIER SCREENS.

John Cabot, Hoboken, N. J 728
Western Gas Construction Co., Fort Wayne, Ind..... 708

GAS STOVES.

American Meter Co., New York and Philadelphia..... 741
Keystone Meter Co., Royersford, Pa..... 740
Maryland Meter & Manufacturing Co., Baltimore, Md.. 74
Nathaniel Tufts Meter Co., Boston, Mass..... 740

HOT WATER HEATERS.

Humphrey Co., Kalamazoo, Mich..... 729

GASHOLDER TANKS.

J. P. Whittier, Brooklyn, N. Y..... 736

GASHOLDERS.

Bartlett, Hayward & Co., Baltimore, Md..... 745
Continental Iron Works, Brooklyn, N. Y..... 746
Cruse-Kemper Co., Philadelphia, Pa. 732
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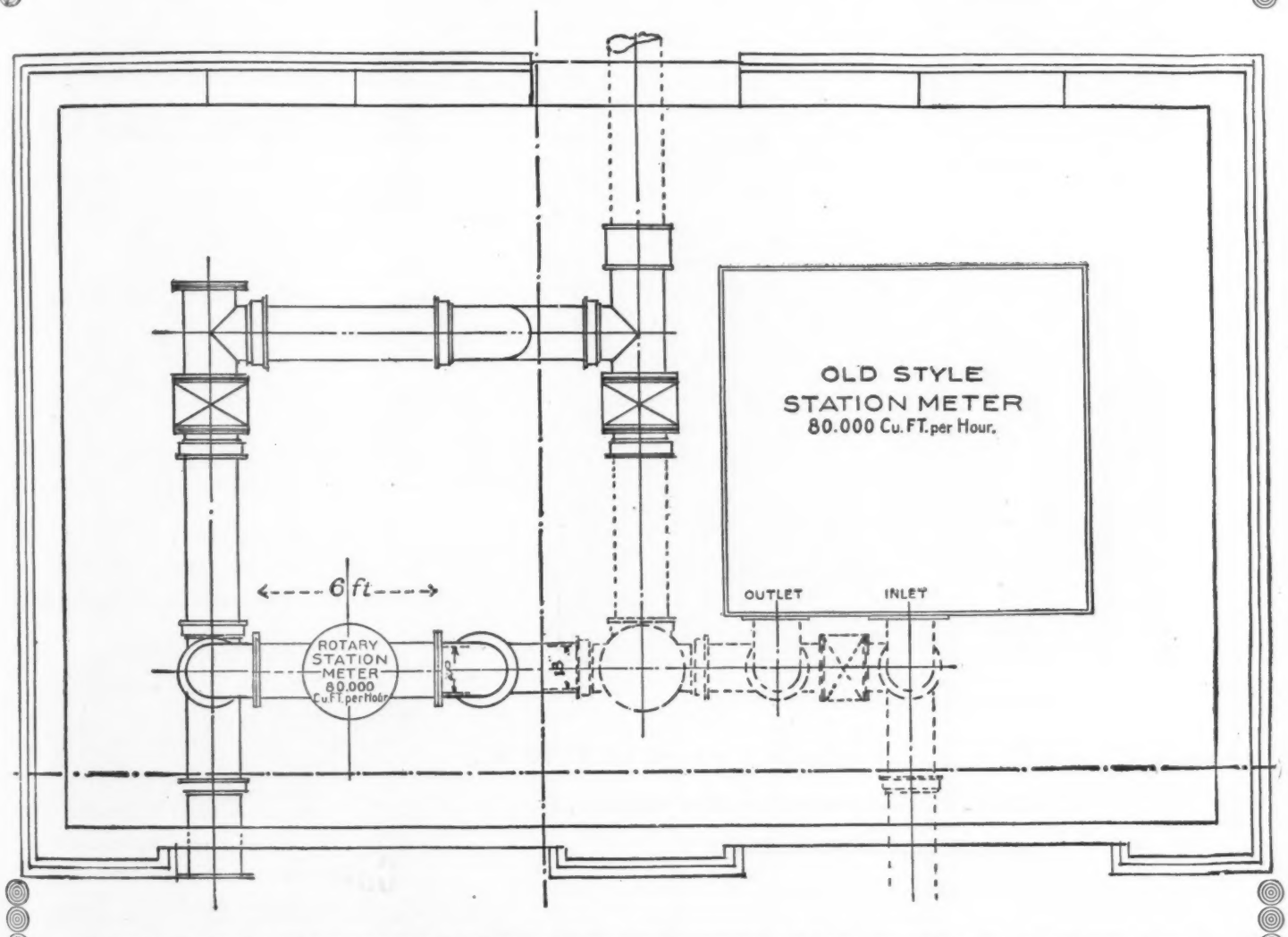

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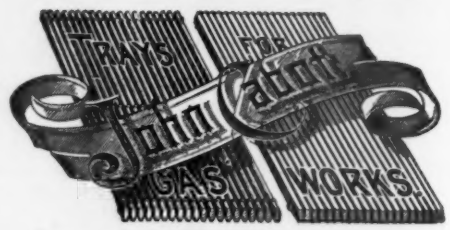

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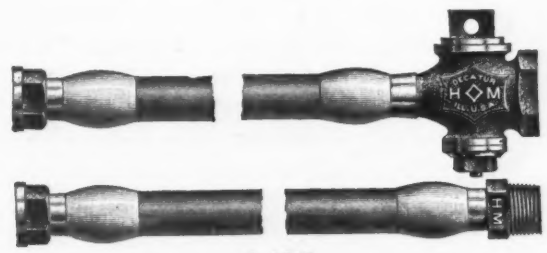

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Pipe evenly machine swedged to nearly half the length of the fittings and only big enough to leave no unoccupied space around the fittings. Solder mostly tin and most of it evenly wiped immediately over the joint. Started right and finished right.

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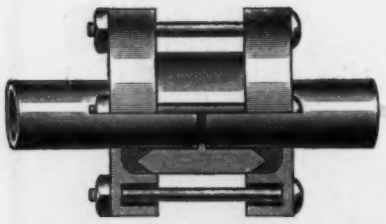
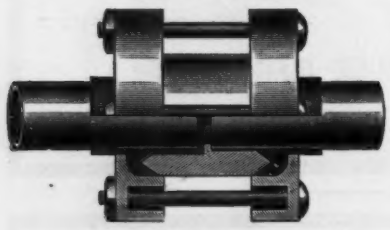
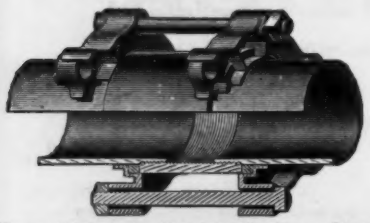
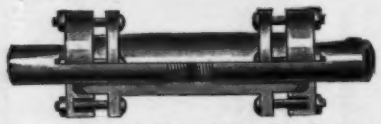

Regular Coupling, Style 1, for Plain End Wrought Iron Pipe.


Insulating Coupling, Style 5, for Plain End Wrought Iron Pipe.


Clamp, Style 4, for Repairing Leaks on Screw Collar.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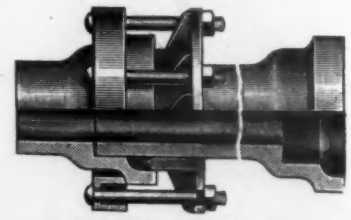
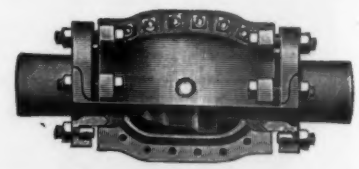
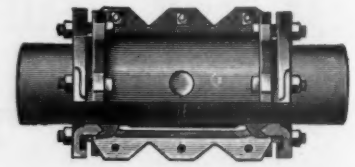
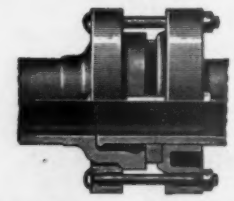

Coupling, Style 9, for Special Style Cast Iron Pipe.


Split Sleeve for Repairing Broken Bell on Cast Iron Pipe.


Split Sleeve for Repairing Broken or Cracked Cast Iron Pipe.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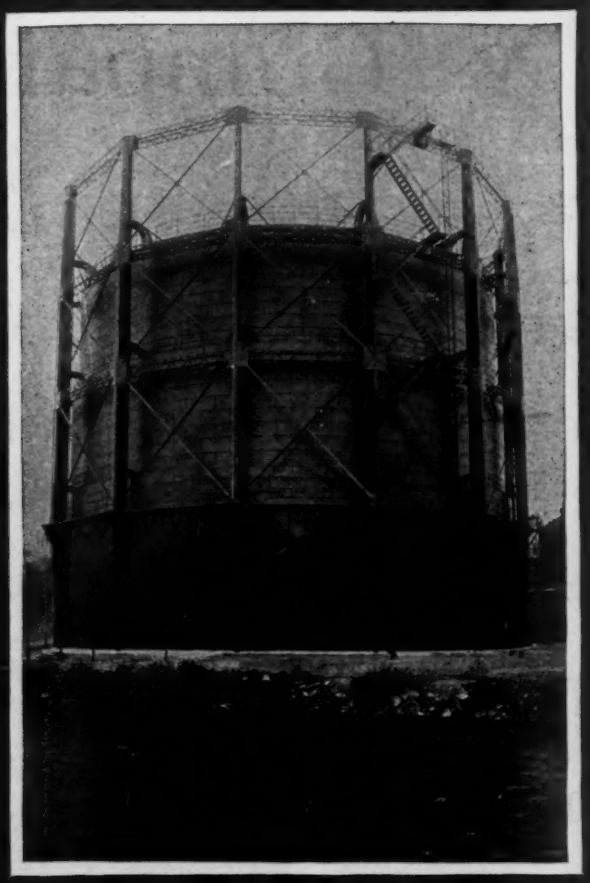

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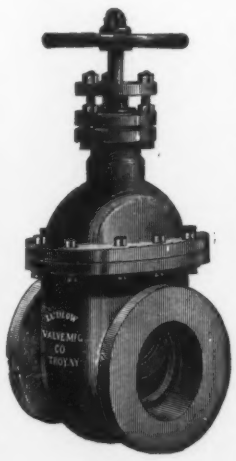

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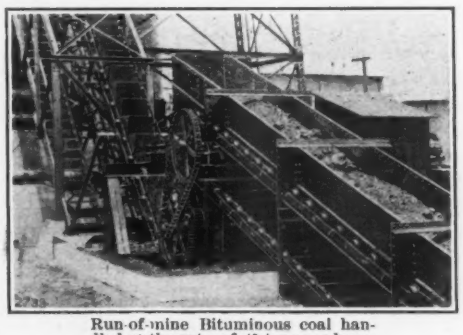

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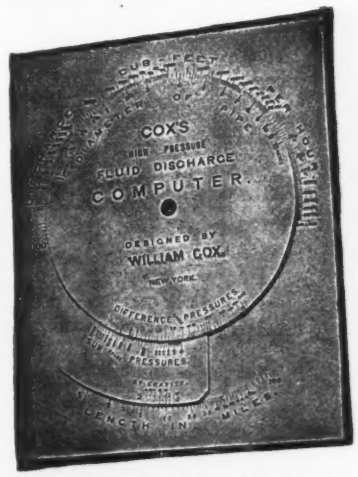

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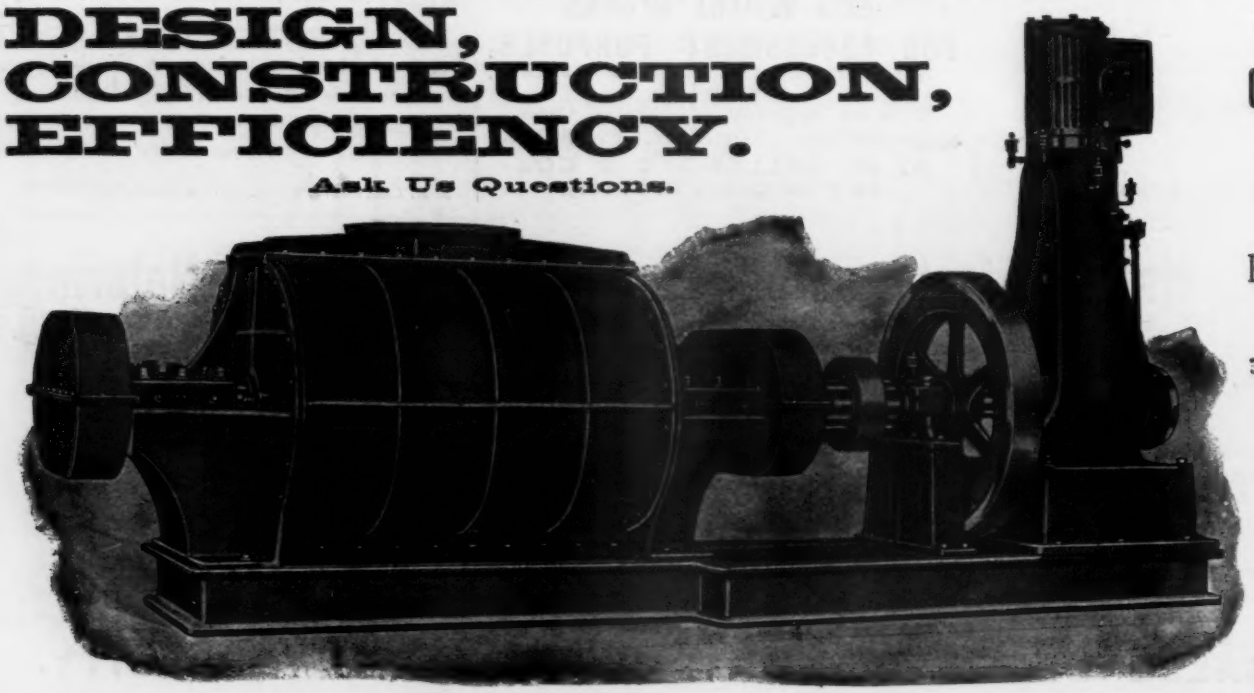

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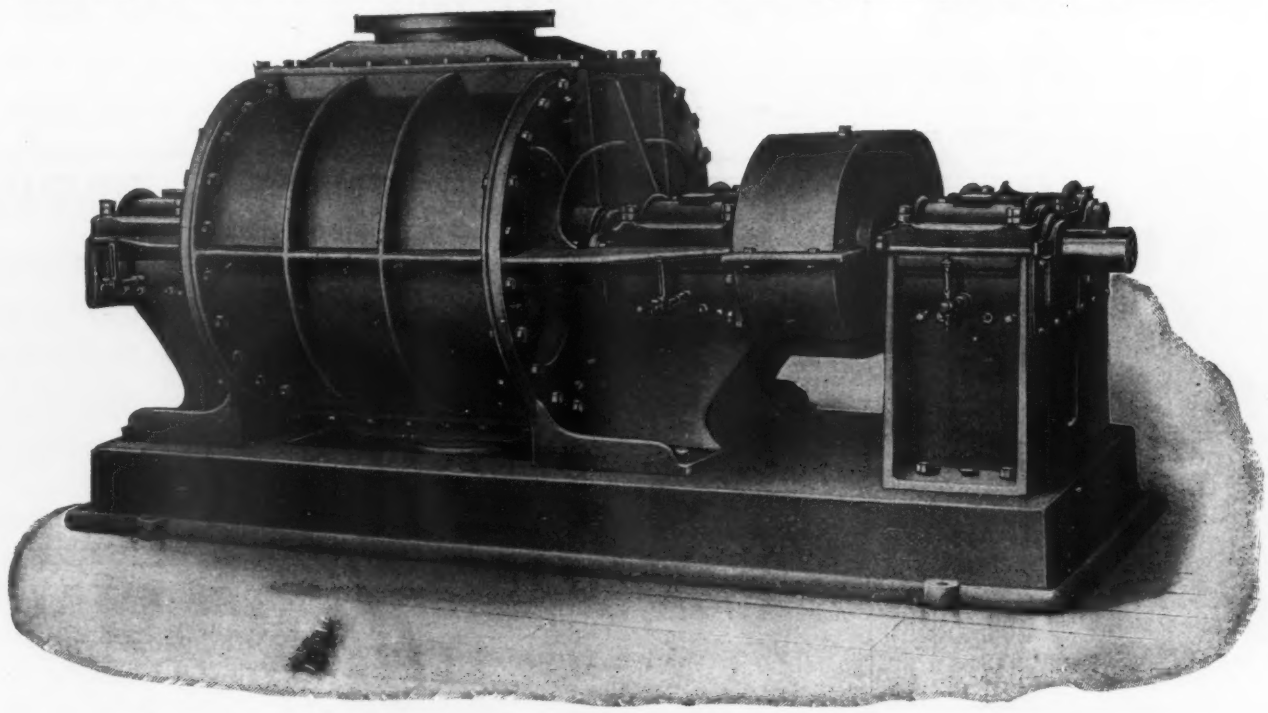

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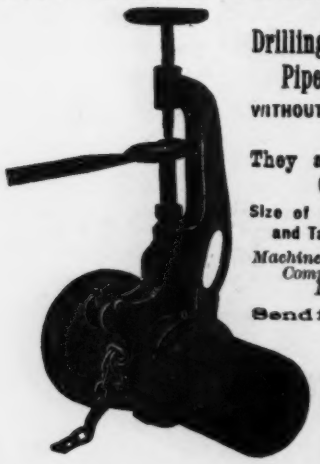

Drilling and Tapping Pipe under Pressure

WITHOUT ANY ESCAPE OF GAS.

They are Strong and Compact.

Size of Combination Drills and Taps ¾ to 4-inch.

Machines Sent to any Gas Company for Thirty Days' Trial.

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Globe Street and Boulevard Lamps.

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THOUSANDS IN USE WITH INCANDESCENT BURNERS.

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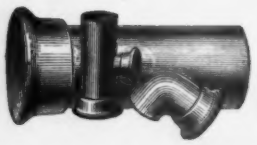

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FROM THREE TO FORTY-EIGHT INCHES DIAMETER. ALSO, ALL SIZES OF

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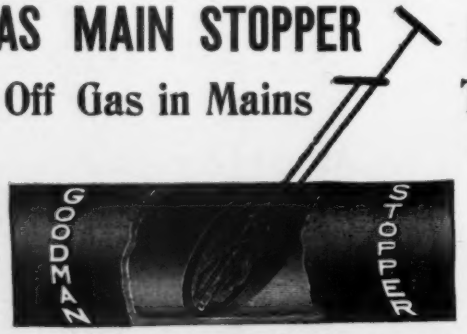
For Shutting Off Gas in Mains

Any size gas main can be shut off in 30 seconds. : : :



Temporarily during alterations and repairs. : : : :

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Revolving or with lateral traverse.

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THE PURIFIED GAS REVIVES THE FOULED OXIDE.

FIELD'S ANALYSIS

For the Year 1905.

An Analysis of the Principal Gas Undertakings in England, Scotland and Ireland. Being the 37th Year of Publication.

COMPILED AND ARRANGED BY **JOHN W. FIELD,**

Secretary and General Manager of The Gas Light and Coke Company, London.

PRICE, $5. FOR SALE BY

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AMERICAN METER CO.,

NEW YORK, ST. LOUIS, PHILADELPHIA, SAN FRANCISCO, CHICAGO,

Photometrical and Experimental Apparatus.

PUBLIC LIGHTING TABLE.

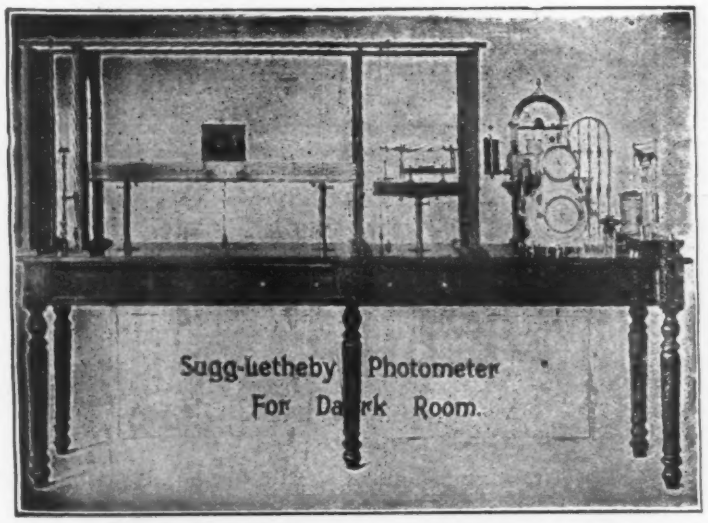
NOVEMBER, 1906.

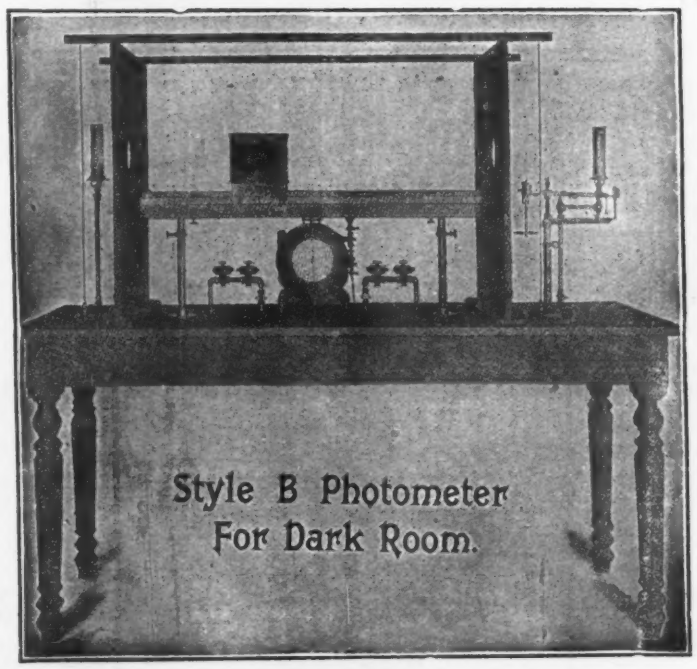
Day of Week.	Date.	Table No. 1. Following the Moon. Light.	Extinguish.
Thu.	1	No L.	No L.
Fri.	2	5.30 PM	7.10 PM
Sat.	3	5.30	7.50
Sun.	4	5.20	8.30
Mon.	5	5.20	9.10
Tue.	6	5.20	10.00
Wed.	7	5.20	10.50
Thu.	8	5.20 LQ	11.50
Fri.	9	5.20	12.50 AM
Sat.	10	5.20	1.50
Sun	11	5.20	3.00
Mon.	12	5.20	5.40
Tue.	13	5.20	5.40
Wed.	14	5.20	5.40
Thu.	15	5.20 NM	5.40
Fri.	16	5.20	5.40
Sat.	17	5.20	5.40
Sun.	18	5.10	5.50
Mon.	19	5.10	5.50
Tue.	20	8.20	5.50
Wed.	21	9.20	5.50
Thu.	22	10.30 FQ	5.50
Fri.	23	11.30	5.50
Sat.	24	12.30 AM	5.50
Sun.	25	1.30	6.00
Mon.	26	2.30	6.00
Tue.	27	3.30	6.00
Wed.	28	4.30	6.00
Thu.	29	No L.	No L.
Fri.	30	No L. FM	No L.

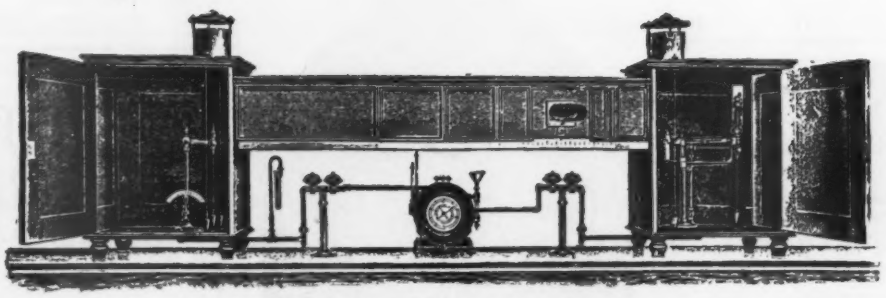
TOTAL HOURS DURING 1906.

By Table No. 1.

	Hrs.Min.
January	223.40
February	190.40
March	192.10
April	167.00
May	152.20
June	142.10
July	150.20
August	157.40
September	170.00
October	185.10
November	201.40
December	214.00
Total, yr.	2146.50







Closed Photometer For Light Room.

CIRCULARS SENT ON REQUEST.

PUBLIC LIGHTING TABLE.

NOVEMBER, 1906.

Day of Week.	Date.	Table No. 2. New York City. All Night Lighting. Light	Extinguish.
		P. M.	A.M.
Thu.	1	4.45	5.35
Fri.	2	4.45	5.35
Sat.	3	4.45	5.35
Sun.	4	4.45	5.35
Mon.	5	4.40	5.45
Tue.	6	4.40	5.45
Wed.	7	4.40	5.45
Thu.	8	4.40	5.45
Fri.	9	4.40	5.45
Sat.	10	4.40	5.45
Sun.	11	4.40	5.45
Mon.	12	4.30	6.00
Tue.	13	4.30	6.00
Wed.	14	4.30	6.00
Thu.	15	4.30	6.00
Fri.	16	4.30	6.00
Sat.	17	4.30	6.00
Sun.	18	4.30	6.00
Mon.	19	4.25	6.00
Tue.	20	4.25	6.00
Wed.	21	4.25	6.00
Thu.	22	4.25	6.00
Fri.	23	4.25	6.00
Sat.	24	4.25	6.00
Sun.	25	4.25	6.00
Mon.	26	4.20	6.10
Tue.	27	4.20	6.10
Wed.	28	4.20	6.10
Thu.	29	4.20	6.10
Fri.	30	4.20	6.10

TOTAL HOURS DURING 1906.

By Table No. 2.

	Hrs.Min.
January	423.20
February	355.25
March	355.35
April	298.50
May	264.50
June	234.25
July	243.45
August	280.25
September	321.15
October	374.30
November	401.40
December	433.45
Total, yr.	3987.45

NEW YORK, 318 West 42d Street.
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PHILADELPHIA, Broad and Arch Streets.
ST. LOUIS, 712 Roe Building.
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By means of the Welsbach System of street lighting the superiority of GAS over electricity for street lighting has been fully demonstrated.

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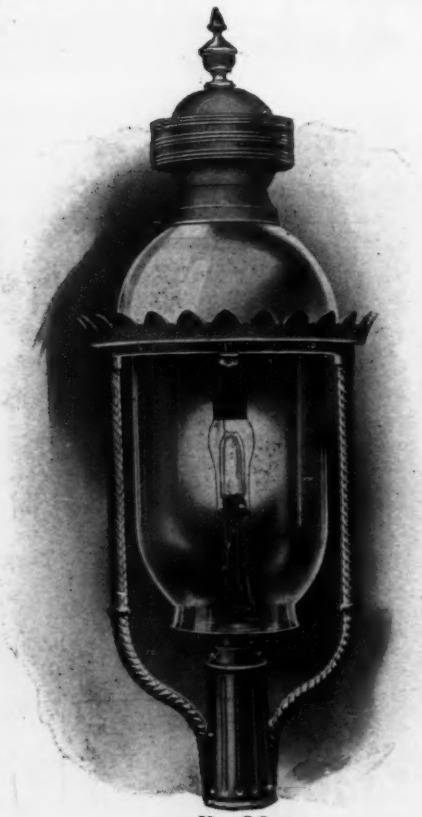
IT LIGHTS THE STREET.

Where there are no gas mains we can furnish an equally good light by our SELF-GENERATING NAPHTHA WELSBACH BURNER, and thereby supply a uniform light in all localities.

Correspondence Solicited from Gas Companies and Others interested in Municipal and Outside Lighting.



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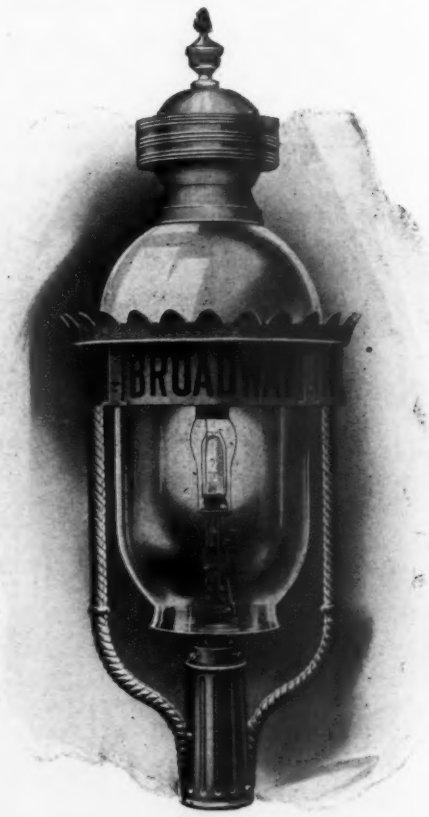

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Standard Length, 30 inches.
The New No. 7 Welsbach Dining Room Fixture, when ordered, will be sent complete, as follows:

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1 No. 4 Pilot By-pass.
1 No. 4197 Mantle — Intensive Brand.
1 No. 306 Chimney (air hole).
1 Fourteen-inch GREEN Art Glass Shade, with six-inch Green Beaded Fringe.

VARIATIONS.

Finished in oxidized copper, oxidized brass, etc., 25 cents extra.

Shades in Ruby and Green--Ruby, Amber and other colors, without extra charge.

Special colors require a few days extra time to fill orders.

Green Shades will be shipped unless otherwise ordered.

This fixture is being largely used by Gas Companies as a dining room fixture at the popular retail price of $10 complete, and is a great favorite for moderate sized two and three-story residences. In popularity and price it is unequalled.

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For the Six Months Ending July 1st, 1906, has been Awarded Contracts for 25 Sets of

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Council Bluffs, Ia. (2d contract).	**Muskegon, Mich.**	**Waterville, Me.**
Seattle, Wash. (2d contract).	**Nazareth, Pa.** (2d contract).	**Washington, D. C.** (3d contract).

TOTAL SETS TO JULY 1, 1906, = = = = = 618
TOTAL DAILY CAPACITY TO JULY 1, 1906, 488,930,000 CUBIC FEET.

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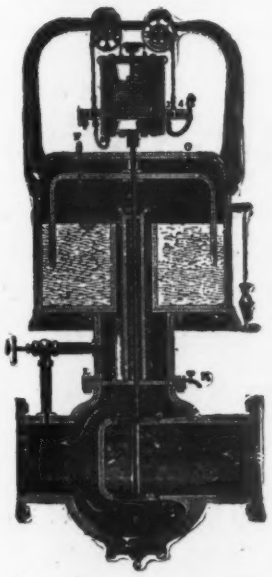

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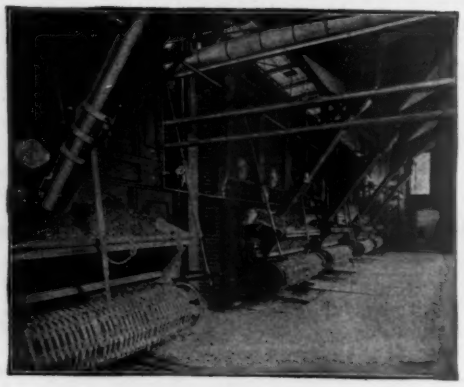

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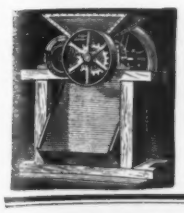

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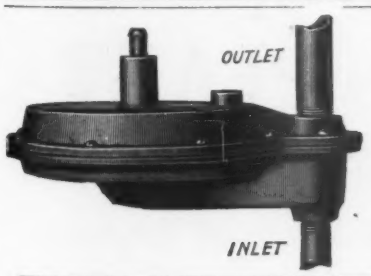

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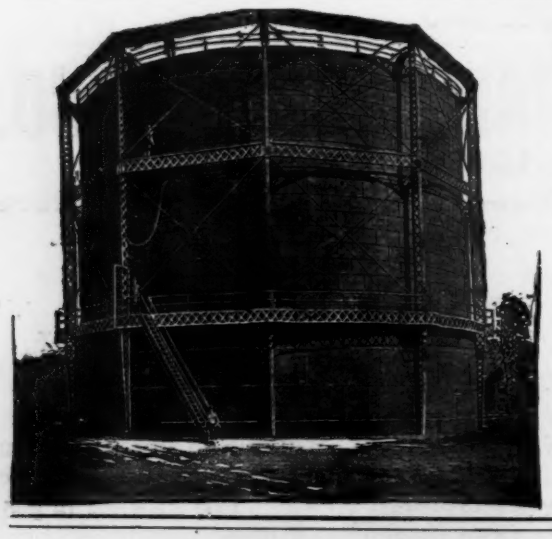

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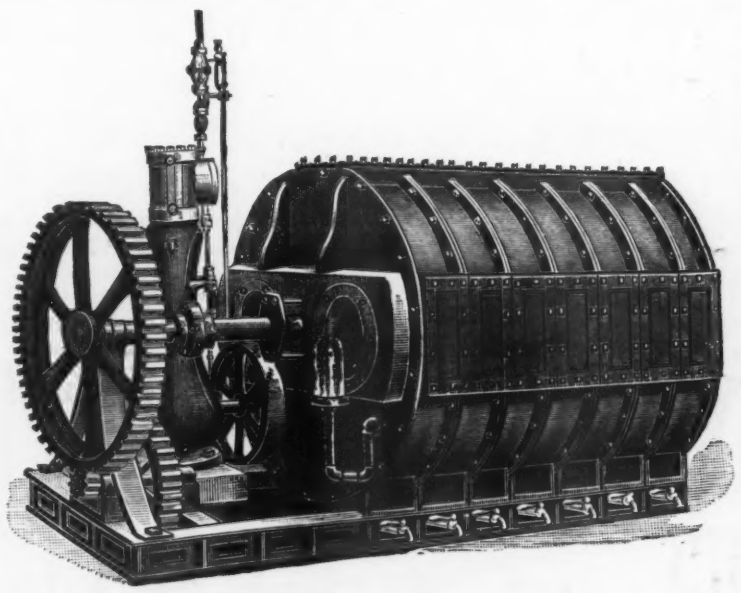

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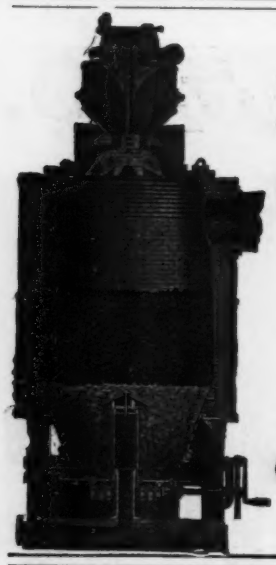

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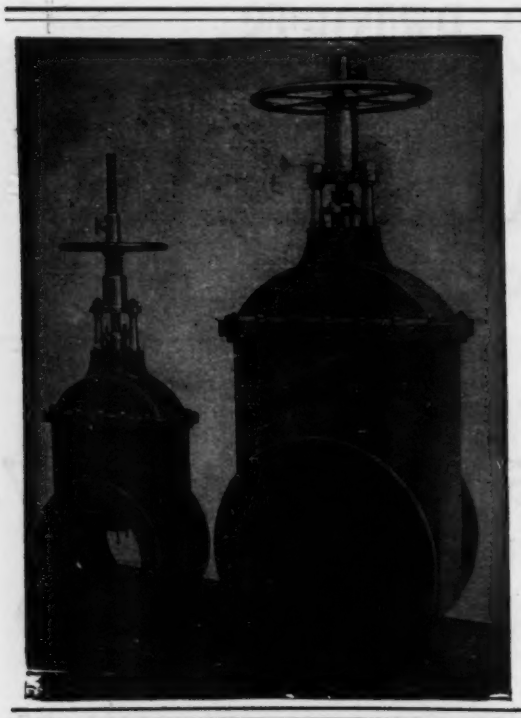

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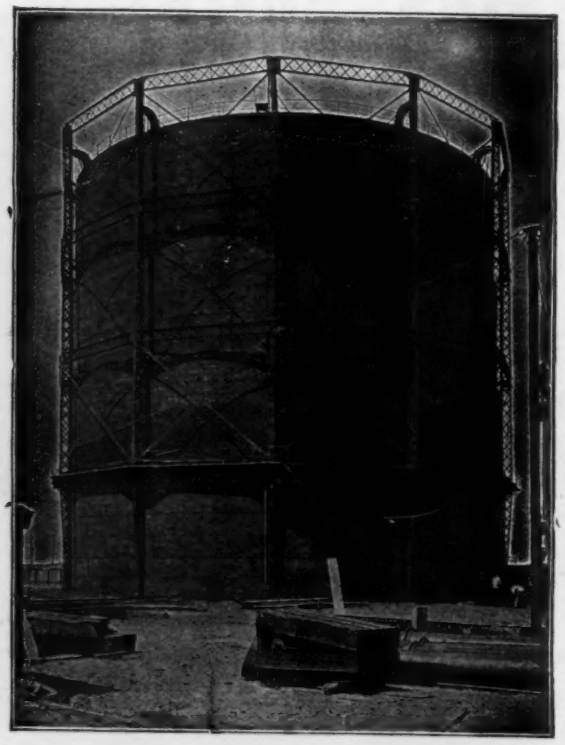

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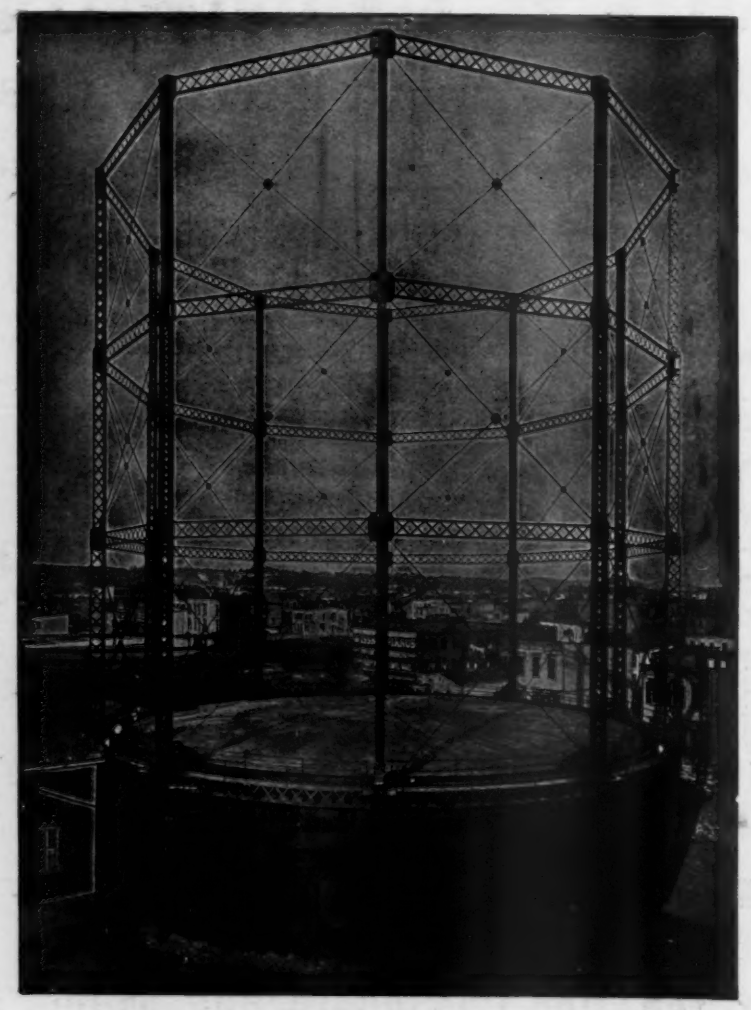

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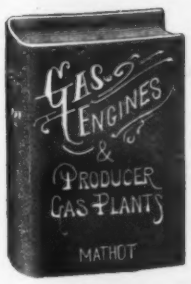

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